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ROYAL COMMISSION OF INQUIRY INTO CERTAIN
DEATHS AT THE HOSPITAL FOR SICK CHILDREN AND
RELATED MATTERS.

HASTREITEK

Hearing held
8th floor
180 Dundas Street West
Toronto, Ontario

X Labaw

The Honourable Mr. Justice S.G.M. Grange

Commissioner

P.S.A. Lamek, Q.C.

Counsel

E.A. Cronk

Associate Counsel

Thomas Millar

Administrator

Shanahan
Tobias

Transcript of evidence
for

December 14, 1983

Re Ex² Humb
EAC.

VOLUME 81

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ROYAL COMMISSION OF INQUIRY INTO CERTAIN
DEATHS AT THE HOSPITAL FOR SICK CHILDREN
AND RELATED MATTERS.

Hearing held on the 8th Floor,
180 Dundas Street West, Toronto,
Ontario, on Wednesday, the 14th
day of December, 1983.

- - - - -


THE HONOURABLE MR. JUSTICE S.G.M. GRANGE - Commissioner
THOMAS MILLAR - Administrator
MURRAY R. ELLIOT - Registrar

- - - - -

APPEARANCES:

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D. YOUNG	Counsel for The Metropolitan Toronto Police
K. CHOWN	Counsel for numerous Doctors at The Hospital for Sick Children
F. KITELY	Counsel for the Registered Nurses' Association of Ontario and 35 Registered Nurses at The Hospital for Sick Children

(Cont'd)



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APPEARANCES: (Continued)

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E. FORSTER	Counsel for Phyllis Trayner - Nurse
J.A. OLAH	Counsel for Janet Brownless - R.N.A.
B. JACKMAN	Counsel for Mrs. M. Christie - R.N.A.
S. LABOW	Counsel for Mr. & Mrs. Gosselin, Mr. & Mrs. Gionas, Mr. & Mrs. Inwood, Mr. & Mrs. Turner, Mr. & Mrs. Lutes, and Mr. & Mrs. Murphy (parents of deceased children)
F.J. SHANAHAN	Counsel for Mr. & Mrs. Dominic Lombardo (parents of deceased child Stephanie Lombardo); and Heather Dawson (mother of deceased child Amber Dawson)
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E R R A T A

Volume 80, Tuesday, December 13, 1983

Page 7472, line 18 - should read "...she could not
have had any direct involvement..."



INDEX OF WITNESSES

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A/BN/ak

1
2 ---Upon commencing at 10:35 a.m.

3 DR. ALOIS RUDOLF HASTREITER, Resumed
4 THE COMMISSIONER: Mr. Labow, are
5 you ready?

6 MR. LABOW: I am ready,
7 Mr. Commissioner.

8 THE COMMISSIONER: All right.
9 CROSS-EXAMINATION BY MR. LABOW:

10 Q. Good morning, Doctor.
11 A. Good morning.
12 Q. My name is Steven Labow and
13 we represent the parents of six of the children who
14 died. I am going to review briefly, some not so
15 briefly, but most of them very briefly, all six. I
16 would like to start off with Paul Murphy.

17 Now, in Paul Murphy's case at Volume
18 77, page 6887 you told Mr. Lamek that with regard
19 to Paul Murphy, everybody else had disagreed with
20 your opinion and that you eventually changed your
21 opinion. Now, prior to the changing of your opinion,
22 why was it your opinion such that you thought Paul
23 Murphy might have been a child who died from digoxin
24 overdose?

25 A. Excuse me, maybe I could wait
for the volume here. I do not have the Volume 77.



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What page would that be, please?

Q. Page 6887.

A. All right.

THE COMMISSIONER: It is also page 111 of your own report, if you want to look at that.

THE WITNESS: Thank you. Well, I think I state here on page 6887 that when I reviewed his chart, I also felt that the probability of natural death was very high, but I was not quite sure about the event immediately preceding his death. Therefore, I classified him as a fair case.

See, I only had three categories. One was to completely rule out an overdose. The other extreme would be one in whom I would have some reason to suspect that an overdose had been given, and then the middle category, in the middle was one where I could not completely rule out, although the index of suspicion was very low, and in looking at Paul Murphy's case there is very little question that this was a child who was terminally ill and was expected to die.

The only question would be with regard to the terminal event, what happened then. Was this really a natural situation or not, and can we completely rule out something else. I was not quite



1
2 sure at the time, but it did not take much to convince
3 me, you know, from talking to other people who
4 had known the situation a little better, that we could
5 exclude him as a possible ---

6 MR. LABOW: Q. Well, Doctor, at
7 page 54 of your report ---

8 A. 54?

9 Q. 54, also page 111 and 214;
10 they are all the same.

11 A. Yes.

12 Q. You comment upon the very last
13 event in Paul Murphy's life where he had been sitting
14 up eating and drinking, talking to the nurses,
15 appeared well oriented. Then he had a bowel movement,
laid down, stopped breathing and died.

16 A. Yes.

17 Q. You then go on to comment at
18 the very bottom that while he was expected to die,
the death occurred somewhat suddenly and unexpectedly.

19 A. Right.

20 Q. Now, is that comment made based
21 upon his clinical condition at the time?

22 A. Yes, because although he was
23 terminally ill, it was not quite clear to me that
24 there was an indication at that particular time
25



1
2 that he was going to die and very often there will
3 be in cases like this, but later, I believe that
4 perhaps obtaining more facts and putting everything
5 together, it did become clearer that yes, this was
6 more or less expected and he could be categorized
7 as a natural death.

8 Q. Well, Doctor, at Volume 14,
9 page 2351 when Dr. Rowe was asked about this child
10 he said that for four days, for the four days he
11 was in Hospital on this occasion his vital signs
12 appeared to be relatively stable.

13 Now, would you expect a child whose
14 vital signs were stable for four days to die in that
15 manner, in the manner that Paul Murphy died?

16 A. Maybe I should look at
17 Dr. Rowe's comments.

18 Q. While we wait for that, the
19 chart is in front of you.

20 A. Yes.

21 Q. Would you turn to the progress
22 notes at pages 126 to 130?

23 THE COMMISSIONER: I am having
24 some trouble. Page 126 or 136?

25 MR. LABOW: 126.

THE COMMISSIONER: I guess you are



1
2 right, but somebody seems to have been scribbling on
3 my page 126. Is that the one you meant?

4 THE WITNESS: Yes, that is what I
5 have.

6 MR. LABOW: Q. I am sorry,
7 starting at page 124, page 124, Doctor. I am really
8 only looking to certain comments in the progress
9 notes.

10 A. Yes.

11 Q. At page 124, on the day of
12 his admission, of this admission, Paul Murphy looked
13 pale, had blue extremities and had two episodes of
nausea.

14 A. This is the note from the
15 19th of August?

16 Q. That is correct.

17 A. Looked pale with blue
18 extremities and so forth. I do not see the nausea
there.

19 Q. It is the fifth line down.

20 A. Oh yes, two episodes of
21 nausea, yes.

22 Q. Now, Paul Murphy had been
23 admitted for a neurological evaluation because he
24 had shown lethargy, vomiting, confusion. Are all
25



1
2 those symptoms of digoxin intoxication?

3 A. First of all, maybe I have
4 two answers here for you. One is that he had
5 different symptoms. He had what is called hemiballis-
6 tic type movements on the left side, episodes of
7 confusion and so forth. These, I think, would be
8 very unlikely to be related to digoxin toxicity,
9 but what you just mentioned, the symptoms you just
10 mentioned were less specific and could very well be
11 associated with digoxin toxicity because they could
12 be associated with many, many different causes, in
fact.

13 Q. The symptoms that would not
14 be likely related to digoxin toxicity, would they
15 be likely related to his underlying cardiac problems
16 or would this be something totally different?

17 A. I do not think they would be
18 direct -- they would be indirectly related to his
19 underlying cardiac problem. They would reflect
20 central nervous system disease, which was acquired
21 later, but which is probably related to his original
cardiac problem.

22 Q. Now, Doctor, on the 21st of
23 August at page 128, the top note on that page points
24 out that his leg edema was improved and Paul stated
25 that he felt better.



BmcB.jc

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And on the following page, the beginning of the note on the 22nd of August it says he had a restful night.

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A. Yes.

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Q. And at the top of page 130 it also points out that he slept well.

7

A. Yes.

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Q. And the note beginning just under that note says that his vital signs were stable, on the 23rd of August at 7 p.m., 1900.

10

11

A. Yes.

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Q. But then at 10:25 he has a terminal event that you pointed out in your original report?

13

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A. Yes.

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Q. Is that kind of progression something that you think is common with his underlying heart problems? He seemed to be stable, he was sitting up and talking and then he suddenly died.

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A. Well, perhaps I should indicate

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that I mentioned that his leg edema is improved, but anybody who has leg edema like this is obviously

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very, very sick because, after all, one tries to

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eliminate this edema, and I am sure they have tried

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for a long, long time but they couldn't and that means

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B.2

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2 that the cause of this edema, which was his heart
3 primarily, was very bad. Yes, I would accept this
4 progression as being part of his natural course. As
5 we have indicated several times, I am sure the
6 witnesses have too, progress notes don't always
7 reflect every detail and every problem that occurs,
8 plus the fact that they are only as good as the
9 observer and sometimes the observer may have been
10 impressed one way or another, and this is reflected
11 in the note.

11 Yes, I would accept this as his
12 natural course.

13 Q Now, when you first reviewed
14 the chart before you had your meeting, you reviewed
15 the chart and you felt there was some kind of
16 suspicion. What at the meeting would make you change
17 your mind? There was no toxicology to refer to.

18 A No, I think the circumstances,
19 you know, this was my first exposure to the case. I
20 had read the chart for the first time. Later at the
21 meeting I talked to the others at the meeting who
22 had also read the chart and who probably knew certain
23 findings or circumstances which I did not know and
24 which are not always clearly reflected in the notes
25 in the chart. Since this was a very borderline



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situation to begin with, it didn't take much for me to be convinced that, yes, this could be classified as a natural cause of death.

Q. Thank you, Doctor. Can we turn to Matthew Lutes.

Doctor, on your severity scale you rated Matthew Lutes as 6.

A. Yes.

Q. And at page 19 of your report you comment that his clinical condition had progressively deteriorated and his death was not unexpected but it was unusual for an isolated ventricular septal defect to lead to death.

THE COMMISSIONER: At the top of page 19, that is supposed to be Matthew Lutes, I've got blank. I take it it is Matthew Lutes?

MR. LABOW: It is supposed to be Matthew Lutes, Mr. Commissioner.

Q. Now, you claim it is unusual for that kind of defect to lead to death in your original comment but when you do your next report on page 127 you don't continue with that comment, it no longer seems to be something that you have considered. How often does an isolated ventricular septal defect lead to death when a child is in hospital?



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A. Well, here again, one will have to look at the whole child. It is not just the isolated ventricular septal defect we are talking about, I believe he had two defects and they were large. I also mention a coarctation of the aorta, which is preductal and atrial septal defect. But I think you are right that the isolated ventricular septal defect per se will not usually lead to a child's death. It may occasionally but it is rather unusual.

However, this child had other features and it is specifically stated that he had a dysmorphic feces, flattened bridge of the nose, bifid uvula, short broad neck, widely spaced first and second toes, long fingers, small accessories, spleen, et cetera, features which suggest perhaps that he had a chromosomal abnormality which very often leads to other serious problems, including central nervous system problems.

I don't have a complete - maybe I should look at the autopsy report here if we have one and see what they say.

Q. The preliminary autopsy is at page 36 of the chart, final autopsy report at page 19 or 31, it is in the chart twice.



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A. The last sentence says here:

"The results of chromosomal analysis were not available at the time of the autopsy. So, this issue has not been totally clarified."

I can say, I can state that many children, babies with chromosomal anomalies will die very early, depending on the type and so forth but it was not unusual. So, that would be a very important consideration, in addition to the heart problem.

THE COMMISSIONER: Is there some way we could tell which of these - I don't know how you can describe them, these defects. I take it this defect affected his appearance very much?

THE WITNESS: Yes.

THE COMMISSIONER: Do those defects normally result in early death?

THE WITNESS: Well, I can't speak about this baby specifically because I'm not sure what exactly this was. The appearance of this baby is not so severe from the description that it will be one of the major chromosomal anomalies. The major ones, yes, they will produce early death, usually they will live only a few months or weeks.



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Hastreiter, cr.ex.
(Labow)

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But I'm not sure that this baby belongs into a major
chromosomal anomaly. There are certain ones such
as trisomy-13 or trisomy-18 which are known to kill
these babies very early.



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Q. Doctor, at page 8 of the
Hospital record there is a letter from Dr. Hughes,
and in the third paragraph she says:

" ... undoubtedly Matthew's under-
lying problem and the cause of his
congenital heart defect was a
chromosome abnormality."

Would that kind of abnormality which
seemed to be the basis for his heart problem, cause
the symptoms that Matthew exhibited in his last two
or three days of life?

THE COMMISSIONER: Mr. Labow, is
the letter of November 1st in the chart somewhere?
Dr. Hughes makes a reference, I see she makes a
reference to a letter.

MR. LABOW: Yes, Mr. Commissioner, I
think it is on page 19.

THE COMMISSIONER: Page 19 is the
final autopsy report in mine.

THE WITNESS: Well --

MR. LABOW: Page 10, Mr. Commissioner.

THE WITNESS: Page 10?

MR. LABOW: Q. Page 10, that is the
November letter from the same doctor, that letter
was prior to them realizing that they had received
a skin sample.



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A. Yes. On page 11 they mention Dr. Uchida, who is a world famous geneticist, very famous lady.

On page 9, there is a report of the chromosome study. I am not very familiar with this type of anomaly, this is not one of the more common ones, and I really can't answer your question, I am sorry. It is unusual, it is a 46/XY/5p+ type category, and I think it probably would take a geneticist to really give you a good answer here.

Q. Thank you, Doctor.

Now, Doctor, at page 49, the child was vomiting and his digoxin level was only 2.1. Dr. Rowe commented at line 14, page 2437:

"That it might have been too high for this child, the level of 2.1."

Is it possible that the cardiac problem and the cardiac defects that this child had made him more susceptible to the effects of digoxin?

A. Well, there are many factors which will make a baby more susceptible to the effects of digoxin, and they are not necessarily related to the heart, although the status of the myocardium is important; a very bad myocardium will not tolerate a high level of digoxin. But the electrolytes in



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the blood, for instance a low potassium level in the blood will make the baby very sensitive to digoxin. Anemia, hypoxia, hypoxemia, lots of factors. So, yes, I agree with Dr. Rowe that it may very well be that for this particular baby the level of 2.1 is high. I think what we call therapeutic levels again apply for the general population, but there are exceptions, there are individuals who will require higher levels, and others who will not tolerate the lower levels.

Q Well, Doctor, this child in his last three days of life exhibited persistent vomiting, lethargy; and at page 54 in the bottom note, pointed out that the child became severely bradycardic before the arrest?

A. Yes.

Q Now, without any further digoxin information on this child, can we be certain that digoxin was not the cause of death here? I am not asking perhaps with certainty, Doctor, you have told us that all this is based upon probabilities.

A That is exactly it. I would say you can never be totally certain in any situation, not even in Paul Murphy's case. But I would say that the probability level here would be so extremely low



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that from a practical standpoint, yes, one could
eliminate I think the possibility.

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Q. Thank you, Doctor. Can we
turn to Philip Turner?

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A. Thank you.

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Q. Now, Doctor, in Philip Turner's
case the severity scale for his heart disease was 9,
but you comment at page 2 of your original report,
and page 22, that the suddenness of the terminal
events and the death were surprising. Then at page
103, that the terminal event was perhaps somewhat
sudden and the infant's condition was reasonably
stable at that time?

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A. Right.

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Q. Now, when you went to your
meeting both you and Dr. Fay rate this child low
suspicious, all the other doctors rate this child
suspicious?

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THE COMMISSIONER: Where is that?

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MR. LABOW: That is the meeting of
September 13th, at page 18.

24

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THE COMMISSIONER: Yes, I know, but
it is the pages I am having trouble with, page 18?

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MR. LABOW: Page 18.

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Q. Now, Doctor, this child had

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been transferred from the Intensive Care Unit on the 30th of July after surgery on the 19th of July, and died just over a day later. The fact that he was transferred from ICU would indicate to me that he was relatively stable?

A. I am sorry, he was transferred on what date?

Q. The 30th of July.

A. Yes.

Q. And he died early in the morning on the 1st of August?



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Q. And you comment at pages 21 and 22, when you originally go through the charts, that his postoperative course was uneventful?

A. Yes.

Q. Now, without any digoxin information, because there was no toxicology on this child, with this kind of situation, could you ever classify a child as more than suspicious?

A. No, I do not believe so. The reasons are as follows.

Perhaps I should clarify one issue here first. There is a little disagreement at the meeting in some, I call it low suspicious, others call it suspicious. But we did not have a category of low suspicious, so actually, low suspicious and suspicious fall into the same category. We only had, I believe, four categories, so really from a practical standpoint it makes no difference. It certainly indicates an individual level of suspicion, I am sure.

This baby had a very, very serious type of heart problem, and if you take a large population of babies with this lesion who are operated on, the mortality either at surgery or after surgery is very high or is high, plus the fact that the surgery is very often not a solution to the



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baby's problem. The baby has a very small left ventricle, has severe obstruction of the aorta and the surgeon cannot relieve these problems adequately.

So, this is, I think, a very important factor to be taken into consideration. However, as you mention, the baby was reasonably stable at the time and there were no clear indications that the baby was going to die at that particular time. This is why we categorize him as a suspicious death.

Q Now, Doctor, at page 52 of the chart, Dr. Izukawa's arrest note also points out that the cardiac status appeared controlled.

A Dr. Izukawa?

Q Dr. Izukawa. It is the top note on page 52.

A I do not see -- I am sorry, what exactly did you say is ---

Q Cardiac status appeared controlled.

A What line would that be on?

Q It is the 7th line.

A Yes. Well, you know, he also says, however, that femoral pulses were difficult to feel because of cutdowns. One of the very serious



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problems in a situation like this, despite the surgery, is that there will be an obstruction which remains after the surgery, and this could be either at the level of the aortic valve or further down the aorta some place where the coarctation of the aorta was. It will be very important to be able to feel the pulses or to have blood pressures to see how much obstruction there is left.

I am not sure we have this information. So yes, I agree that the baby appeared to be reasonably stable. However, I must admit it does not surprise me terribly that the baby deteriorated very rapidly because this does happen with this type of heart defect.

Q. Now, Doctor, are you any less suspicious than you were at the meeting about this case? Has this case been answered to your satisfaction?

A. No, I have not changed my opinion. I think this is a case that -- I do not believe the level of suspicion is very high, but nevertheless, should be pursued. If there was any way we could pursue this and get the toxicology or some other finding, it would be very helpful.

Q. Could we turn to Barbara Gionas.



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Now, Doctor, you rated this child an 8 on your cardiac severity scale and indicated at page 17 of your original report that she had had two operations and a stormy course and you were not surprised by her death, but that the cardiac arrest could conceivably be related to digoxin overdose.

At page 155 of that report, you then point out that her clinical course appeared to be steadily downhill and the terminal episode was not surprising when it occurred.

A. Yes.

Q. Doctor, could you turn to page 73 of the chart?

A. Yes.

Q. On pages 73 and 74 we have two notes by Dr. Kobayashi, and his impression at that time was that this child might be suffering from digoxin toxicity, and his orders that appear on page 190 of the Hospital record are to hold the digoxin and do a level.

A. Yes.

Q. Now, Doctor, on the 8th of March, or it is the 7th of March in Nurse Trayner's note on page 76.

A. 76?



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Q. The top of page 76.

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A. Yes.

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Q. They have now apparently held
the digoxin, and she comments:

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"Barbara had a very comfortable
night, respirations were much more
regular and easy, did not appear to
be in any respiratory failure, apex
was regular all evening."

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Now, it would appear that this child began to improve
somewhat, but 24 hours later the child began to have
problems and went into arrest and died?

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A. Yes.

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Q. Now, is it possible that
someone gave that child digoxin after digoxin had
been ordered held and that caused the problems to
errupt again?

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A. Maybe I should make a couple of
comments. Of course there are two types of digoxin
overdoses. One is the one which occurs in the
therapeutic setting, and this is what Dr. --

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Q. Kobayashi.

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A. -- Kobayashi was concerned about.

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It is a completely different story, and this is why I
call the other one a massive overdose, which is the

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one we are primarily concerned about.

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This is quite common, a therapeutic digoxin overdose is a very common situation in a busy department such as this one here. Again, we are dealing with a baby that had a very serious problem, had a coarctation of the aorta which was repaired on the 26th, I believe, of January, and then on the 18th of February had another operation because they found that it was not just the coarctation of the aorta but there were, I think, two large ventricular septal defects which produced a very large pulmonary blood flow and congestive heart failure, and for this reason the pulmonary banding was done. I am not sure about -- yes, two large ventricular septal defects.

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Following the operation, the baby did not really improve a whole lot. She was, at some points, reasonably stable, but she really had not improved a lot. It says here on the evening preceding her death the baby had been extremely restless and hard to settle, had refused feeding. She was not gaining weight, she had arrhythmias and vomiting.

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Now, this type of arrhythmia, intermittent atrial flutter and vomiting would make one very suspicious



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of digitalis toxicity, yes, but then she had had a level performed and there was only 1.2. I am not sure about the time relationship of the level with the arrhythmia here because I think there was another level which was 1.9. She had many blood levels done.

But this would be the type of situation that one would encounter in a clinical setting where you are dealing with therapeutic digoxin toxicity.



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Q. Well, Doctor, digoxin was held

3

on March 7th.

4

A. Yes.

5

Q. And Nurse Trayner's note on Page

6

76 seems to indicate that the child was doing some-

7

what better. The nursing note right underneath that,

8

which is a little difficult to read.

9

A. Yes.

10

Q. Says that the apex was stable

11

today and also in the middle of the note it points

12

out that the child tolerated feeds well and had no
emesis.

13

A. Yes.

14

Q. But then the following day,

15

notwithstanding that digoxin is supposed to be held,

16

the child begins to have trouble again. For at least

17

that one day it appeared that the child was doing

somewhat better.

18

A. Yes.

19

Q. After digoxin was held.

20

A. Well, there could be several

21

explanations for this problem. It is sort of interest-

22

ing that they held digoxin despite the fact that the

23

level was relatively low, but that is often done.

24

This again shows that some babies will not tolerate

25



1
2 a very high level of digoxin. This is called a
3 therapeutic test or therapeutic trial where you stop
4 the drug and see what the response is, the clinical
5 response. She appeared to have responded appropriately
6 because she stopped vomiting and the arrhythmia
7 apparently subsided.

8 But later on, a day later, I believe,
9 she started having problems again. One explanation
10 would be that possibly we have a very delicate balance
11 between toxicity of digoxin and how much digoxin the
12 baby needs and by stopping the digoxin her heart
13 failure had become more severe again and heart
14 failure can certainly produce vomiting, increased
15 respiratory rate, tachypnea, problems of this sort.

16 So, this is one explanation which is
17 to me the best. Certainly the administration of
18 additional digoxin would be a possibility, but I don't
19 think we have any evidence of that.

20 Q. Well, Doctor, they did exhume
21 this child.

22 A. Yes.

23 Q. And Mr. Cimbura's report, it
24 is the second to last report, which is Exhibit 95-E,
25 Mr. Commissioner, on Page 2 and 3 it indicates that
the levels of digoxin in her heart were between 201 and



296, which Mr. Cimbura says are likely above average but within the normal range level in the lungs of 205 and 225, the level in the liver 253.

Doctor, the only exhumed tissue levels that I am familiar with are found in Exhibit 276-C, which is an article that was made an exhibit this week and deals with two unusual case reports. Case 1 dealing with a baby girl who died of an overdose and case 2 of a 56 year old man.

A. Could you just wait a second because maybe I can get this exhibit. What is the other's name, do you know?

O. This is Dickson and Blazey.

A. Oh, yes, okay.

THE COMMISSIONER: Which case is it?

MR. LABOW: 276-C.

THE COMMISSIONER: No, but which case?

MR. LABOW: I am going to deal with case 2.

THE COMMISSIONER: The 56 year old man?

MR. LABOW: Because in that case the baby was embalmed and then exhumed.

THE COMMISSIONER: Right.

MR. LABOW: Q. And they did get some



1

2

digoxin levels.

3

A. Are you talking about case 1

4

there, right?

5

Q. No, case 1 is a child.

6

A. Oh, case 2, I see.

7

Q. Is the man whose body was

embalmed and then exhumed.

8

A. All right.

9

Q. And the table at page 148 of

10

that article gives two digoxin readings for liver of

11

14.9 and 13.5 nanograms per ml.

12

Now, the liver reading in

13

Barbara Gionas, who was also embalmed and exhumed,

14

is 253. Now, the conclusion that the authors draw

15

for case number 2 in their article is that this man

16

probably died from natural causes but he had been on

17

digoxin therapy, and I put it to you, Doctor, that

18

this might be a normal reading for embalmed and

19

exhumed tissues for someone who is on therapeutic

digoxin; an average reading.

20

THE COMMISSIONER: Where did you get
the readings, I'm sorry, about this?

21

MR. LABOW: It is Page 148 in table 1.

22

There is case 1 and case 2.

23

THE COMMISSIONER: Oh, I see.

24

25



1
2 MR. LABOW: And the bottom readings are
3 for liver.

4 Now, the child I submit is a little
5 harder to compare because the child wasn't embalmed
6 and exhumed. But notwithstanding that, the conclusions
7 are that the child in this article did die from
8 digoxin intoxication and the liver readings for that
9 child were 210 and 190.

10 THE COMMISSIONER: I'm sorry, which
11 child is that?

12 MR. LABOW: This is case number 1 of
13 the two cases.

14 THE COMMISSIONER: Oh, I see, I see.

15 MR. LABOW: Q. All I am asking you,
16 Doctor, is if this helps at all in trying to interpret
17 what Barbara Giones' exhumed tissue readings mean
18 or could mean.

19 A. Well, as I indicated earlier
20 with respect to other cases, the interpretation of
21 exhumed tissue, and here we deal with an additional
22 problem which is the embalming of the body, it
23 becomes very difficult, I think. I certainly would
24 not use, base my criteria on one case that has been
25 reported here. I think in looking at this data that
we have, the toxicological data, the concentration in



1
2 myocardium of 201 and 290 is more or less within the
3 normal range. I would ordinarily expect that the
4 embalming would reduce it, yes, that iwould be my
5 impression, but I really have no data to substantiate
6 it except isolated instances like this one here.

7 The liver is certainly a little bit
8 high and the lungs perhaps definitely, in fact;
9 muscle is still within an acceptable range for
10 therapeutic fresh tissue, therapeutically treated
11 children. I can only again say, speak about levels
12 of proability, index of suspicion, putting everything
13 together, and I would say, as we said at our meeting
14 of September 13th, that the child was placed in a
15 suspicious category; in fact, we called it low
16 suspicious at the time, but it doesn't matter because
17 it is still suspicious and I believe that I would
18 agree with that category.

19 Q. Okay, thank you, Doctor.

20 I would like to look at Real Gosselin.
21 Mr. Commissioner?

22 THE COMMISSIONER: Well, whatever you
23 like. We started late, so I don't really care when
24 we have a break. Is Real Gosselin the last of the
25 children that you are dealing with?

MR. LABOW: Real Gosselin and Kristin



1

2

Inwood.

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THE COMMISSIONER: Well, perhaps we

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should rise now then for 20 minutes.

5

---Short recess.

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---Upon resuming.

THE COMMISSIONER: I would say that it does look that we will not complete Dr. Hastreiter this morning and we will go into this afternoon. As soon as he is concluded I intend to have the arguments on the stated case, and accordingly I have suggested to Miss Cronk that the next witness need not be called until morning at 10 o'clock. So, all right, Mr. Labow.

MR. LABOW: Q. Doctor, I would like to turn to the case of Real Gosselin. Doctor, you have already discussed this case and you gave this child a severity rating of 8.

A. Yes.

Q. But the comment that the abruptness of the terminal events leading to the baby's death were unexpected. In your report at page 134 you rated this child "good" as a good possibility of digoxin being the cause of death?

A. Yes.

Q. Now there has been comment about your reliance on Dr. Freedom's letter and the fact that Dr. Freedom in his letter expressed the opinion that he didn't really have an answer, but when he came here and gave evidence he told us that



1
2 the chart speaks for itself and that the child had
3 not responded well to the treatment and he didn't
4 feel that way any longer.

5 Could you look at the Hospital record,
6 specifically the progress notes starting at page 43.
7 Now the top note, which is the date of the child's
8 admission on the 17th of December, Nurse MacIntosh
9 says on the fourth line:

10 "The baby appears in no distress."

11 Now, over the next few days, that
12 day and part of the next day, the child experienced
13 arrhythmias, bradycardia, vomiting, increased
14 lethargy. At page 44, Dr. Stephens in his note
15 points out that the digoxin level was 3.9, in the
16 morning, and digoxin was held and they will try
17 Lasix, and if the child failed to improve with the
18 Lasix they would discuss the digoxin issue. So
19 obviously there was some concern about what you
20 term therapeutic overdose with this child?

21 A. Right. The level of 3.9 is
22 high, not necessarily toxic for a baby sometimes,
23 but it is certainly high.

24 Q. Now, the child still continues
25 with many of the same symptoms, irregular breathing,
bradycardia, and at page 22 in Dr. Stephens' discharge



1
2 report ---

3 A. I am sorry, what page?

4 Q. Page 22.

5 A. Page 22.

6 Q. Of the Hospital record, after
7 discussing the general course in Hospital and that
8 the blood gases and electrolytes were normal, he
9 says:

10 "The baby then did well until 2:25
11 on the 18th when he had a prolonged
12 episode of bradycardia. This resolved
13 spontaneously but five minutes later
14 he had another episode and a heart
15 beat could not be felt. The arrest
16 was called but the resuscitation
17 efforts were not successful and the
18 child died."

19 Now on reviewing this chart, do you
20 think you could totally eliminate the possibility of
21 digoxin being the cause of death, or a possible
22 cause of death?

23 A. No. This child had a very
24 serious problem, and I think that Dr. Freedom's
25 letter was a little bit misleading perhaps because
the letter indicated that the baby, that the death



1
2 was somewhat unexpected even for the attending
3 cardiologist. Later he changed his views a little
4 bit, and I would agree with him that ---

5 THE COMMISSIONER: I think that
6 is an understatement that he changed his view a
7 little bit.

8 THE WITNESS: Yes.

9 THE COMMISSIONER: I think he,
10 180 degrees I think roughly ---

11 MR. LABOW: He changed his view
12 completely.

13 THE WITNESS: Completely.

14 THE COMMISSIONER: What is your
15 view now?

16 THE WITNESS: My view is again
17 that this is a very sick baby and I was especially
18 impressed that after surgery the blood pressure
19 showed still there was a significant obstruction
20 left, and we know very well that this type of baby
21 can die suddenly.

22 However, I feel still that we cannot
23 completely rule out digoxin toxicity as the cause of
24 death, and I think at the September meeting we
25 placed this baby in the suspicious category.

MR. LABOW: Q. Yes, you did. Is it



1
2 fair to say that without further toxicological
3 evidence you really cannot be certain one way or
4 the other?

5 A . I don't think there is any
6 case where you can be certain without toxicological
7 evidence.

8 Q. Any more certain than you are.

9 THE COMMISSIONER: You are not
10 certain that you can be certain even then.

11 MR. LABOW: That's right.

12 THE WITNESS: Even with toxicological
13 evidence sometimes one cannot be certain, that's
14 true.

15 THE COMMISSIONER: Well I think
16 I would go even further than that, Doctor. Because
17 even with the best - even in the case we will say
18 of Justin Cook who was perhaps the most obvious case,
19 he still had a condition, but notwithstanding the
20 massive overdose of digoxin that took place he could
21 still have died before that, could he not?

22 THE WITNESS: That is correct.

23 THE COMMISSIONER: So you can't be
24 absolutely certain in any case. I am just suggesting
25 it, it is inviting trouble when you say you cannot
be certain one way or the other.



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MR. LABOW: You are right,
Mr. Commissioner. One thing we have learned in this
there is no certainty in any of the conclusions.

THE COMMISSIONER: No, there is
no certainty in medicine and the law.

THE WITNESS: Right.

MR. LABOW: Q. Now, Doctor,
Dr. Freedom essentially said, and I don't have the
page reference, that the chart in this case speaks
for itself, and he ruled out digoxin as a possibility,
my recollection, as a possible cause of this child's
death; would you go that far?

A. No, I don't think anybody can
rule out completely the possibility, and I think
all we can do is weigh the probabilities. Obviously
Dr. Freedom leans more to the left if I lean more
to the right a little, or something like that.

Q. The last child I would like
to deal with is Kristin Inwood.

A. Thank you.

Q. Doctor, your severity rating
for this child was 6.

A. Yes.

Q. In general terms could you
try to explain to me what the 6 would mean; you have



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rated them from 1 to 10, as I understand it.

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A. Yes. One moment please. This rating was originated to try and establish the probability that the baby would die of natural causes with that type of heart problem and in that clinical condition that the baby presented at that particular time.

I think, as I indicated earlier, another way of looking at it perhaps would be to say that the rating approximates perhaps a probability, in my opinion, that the baby would die of natural causes or unnatural causes. I would say the rating really approximates the probability that the baby would die, right, of natural causes; if the rating is 8 the probability would be high, it would be about 80 per cent that the baby would die of a natural cause, versus 2, which would be only 20 per cent.

THE COMMISSIONER: When you say the baby would die of a natural cause, that is what happens to most of us. When, during what period, what period did you have in mind?

THE WITNESS: At that particular period.

THE COMMISSIONER: Sort of within



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the next month or so?

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THE WITNESS: I would say yes, at
the time when death actually occurred.

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THE COMMISSIONER: Oh, well, in
some of these where you say the chances are 6 or
better you still say, and you still said in this
case - I am not sure that you did - "However, it
appeared to be in a state - likely explanation of
this is cardiac arrest - does not -- "

You are sort of indicating that
the death at this particular time was unexpected?

THE WITNESS: Yes.



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THE COMMISSIONER: So, how do we reconcile that? You say that she has got six chances in ten of dying at this particular time and yet you say it is unexpected?

THE WITNESS: She still has a 40% probability of dying of other causes.

THE COMMISSIONER: Yes.

THE WITNESS: All I am trying to say is that the probability that -- this is without a toxicology on clinical grounds alone.

THE COMMISSIONER: Yes, that is right.

THE WITNESS: That I felt that her chances of dying of a natural cause would be 60% and of an unnatural cause maybe 40%.

THE COMMISSIONER: Well, why then would you rate her as a good -- I know that good does not quite mean what good does ordinarily in the English language. Good means that it is something you should look into, but you would put a good even if the death of the child at that time from her heart ailment was to be expected as it would in the case of Inwood; is that right?

THE WITNESS: Yes, I would in some cases because I still felt that it was not just the minimal level of suspicion but that there was a



1
2 higher level of suspicion.

3 MR. LABOW: Q. Now, Doctor, in this case, if
4 solely on a clinical evaluation without any toxicology
5 whatsoever, you still felt that there was a good
6 possibility that Kristin Inwood died from a digoxin
7 overdose?

8 THE COMMISSIONER: That he rated it
9 good. I am not too sure that that is right. Now,
10 you should be allowed to lead the witness if you
11 want to, but this witness cannot be led, so I am not
12 destroying your cross-examination by doing that. That
13 is not my understanding of what good means. Good
14 simply means, and I think it is defined at the beginning
15 of 261, and it means it is a matter that should be
16 investigated further.

17 THE WITNESS: Yes, page 2.

18 THE COMMISSIONER: Page 2.

19 MR. LABOW: Good probability for massive
20 digoxin overdose.

21 THE COMMISSIONER: No, that is not
22 the right definition.

23 THE WITNESS: No, that is not the
24 right definition. It is simply a case where we
25 felt -- I felt that we should look further into this
baby's situation, and it was not a very low level of



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suspicion.

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MR. LABOW: So good means high suspicion

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on your first ---

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THE COMMISSIONER: There is some place

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where you have set that out appropriately, and I do
not know where that is.

7

THE WITNESS: I thought there was.

8

I do not remember. I mentioned it several times here
earlier, but I do not remember ---

9

10

THE COMMISSIONER: Yes, but I think you

11

had written it down somewhere and it may well be ---

12

THE WITNESS: It may be in a letter

13

that I wrote.

14

THE COMMISSIONER: Well, I have certainly

15

seen it somewhere.

16

THE WITNESS: I think when I sent this

17

information to Mr. Wiley I had written a letter that
went with it. I am not totally sure about it, but

18

I believe so.

19

MS. CRONK: Sir, I do not know if this

20

helps or not, but in the minutes of the September

21

13th meeting there is a definition of Dr. Hastreiter's
four categories at page 2.

22

THE COMMISSIONER: Well, we will try

23

that, but that is not the one I had in mind.

24

25



1
2 MS. CRONK: That is right, sir, and as
3 well, several times during the doctor's evidence
4 including most recently during the cross-examination
5 by Mr. Scott he ---

6 THE COMMISSIONER: Yes, I know about
7 that but I thought I had read somewhere this definition
8 of good meaning that we investigate it. Good does
9 not mean good, that is really what I wanted to ---

10 MS. CRONK: It may be in the body of
11 his report, sir, and I will try to turn that up for
12 you.

13 THE COMMISSIONER: Yes, all right.

14 MR. LABOW: O. Doctor, is it fair
15 to say that without looking at any of the toxicology
16 you still harboured some concern about why this
17 child had died?

18 A. Yes.

19 Q. At that time?

20 A. Right.

21 Q. And your concern was not only
22 because the death was unexpected, but also abrupt?

23 A. Right.

24 Q. Now, Doctor, when you did see
25 Mr. Cimbura's results of the tissue samples, and that
is Mr. Cimbura's first report, pages 7 and 8, at page 8 --



1
2 it is Exhibit 95-A, Mr. Commissioner -- Mr. Cimbura
3 estimates the concentration of digoxin in the heart
4 before it was fixed at not less than 549 nanograms
5 per gram.

6 A. I am sorry. Yes, page 8.

7 Q. Now, in Volume 76 --

8 A. Right.

9 Q. -- when Mr. Lamek examined you
10 about this specific finding you said that was a very
11 conservative estimate?

12 A. Yes.

13 Q. Now, even looking at that as
14 a conservative estimate, but taking that number as
15 a given, would a level in the myocardium of about
16 550 be more than corroborative of the idea that this
17 child died from digoxin overdose?

18 A. I think it would be a strong
19 indicator; it would not be complete proof by any
20 means because there have been reports by others, and
21 I think we have had an occasional child on a
22 therapeutic regime of digoxin who has had levels
23 as high as 500. My cutoff point for therapeutic
24 myocardium concentration in fresh myocardium is
25 450, but there have been occasional, rare exceptions
where children have gone as high as 550 or so.



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Q. Well, if all you had in this case was the clinical history and these toxicology readings, could you still rate it as probable murder or would your opinion change drastically?

A. I believe that at the meeting of September 13, yes, this was a rating that was given to this child. The category -- she was rated as a probable murder, and I think placing the clinical and especially the toxicological evidence together, it seems to me like an appropriate rating.

The blood level was extremely high also. It was 491, and this was the highest level -- this had been the highest level I had ever seen in my life at that particular time, and later I saw a higher one, but it is extremely unusual.

Q. Now, Doctor, we have heard a lot of evidence about that level.

A. Right.

Q. What kind of multiplier effects have you experienced in your research in this area? How high a multiplier have you dealt with?

A. Well, the multiplier, using therapeutic concentrations of digoxin, ranges from 1 to 4, but rarely does it go above 3.

Q. Do you know of any data dealing



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with non-therapeutic administrations?

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A. No, I think this data would be very difficult to arrive at in humans anyway, because it is just very difficult. It would be a fortuitous circumstance where you would get a premortem sample; of course, the post mortem can always be obtained, but the premortem, you know, there are situations, yes, where this has been done, isolated instances and one cannot always believe the data. You know, some reports contain errors and things like this, but I would say that they have ranged from about 2 to 4 again, yes, even with very high levels.



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Q. Now, Doctor, there has been some problem based upon the fact that there had to have been some distribution to the tissues in this case, and we still had that very high reading and correlating those two was a difficulty that everyone seems to have.

Now, this child had been on digoxin therapy and had received a dose not meant for her and died about a day later. Would the previous therapy, or could the previous therapy have had her heart at a level of 400?

A. Yes.

Q. So, it is conceivable that the extra digoxin found in the heart was only 100?

A. Yes.

Q. And that wouldn't require a very long time for distribution?

A. That's right.

So, the distribution factor is really much more difficult to determine because the child had been receiving digoxin therapy.

Q. Now, Doctor, you have answered a number of questions about what I term your mind set when you did your original work and that the whole situation you were in might have affected you in some



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way. Did you consciously suffer any effect from the fact that there were all these "suspicious deaths", or did you try to look at these charts independently?

4

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THE COMMISSIONER: Did you say - what was the question again?

6

MR. LABOW: Consciously.

7

8

THE COMMISSIONER: Consciously, yes, all right.

9

10

THE WITNESS: I'm not sure I understand the question.

11

12

THE COMMISSIONER: He says, did you say, because there are so many other deaths and therefore when you found - there were so many other suspicious deaths I am going to find this one suspicious. It is one of those 'Have you stopped beating your wife' sort of questions I think. However, you answer it in whatever way you like.

16

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THE WITNESS: All I can say is I think that there is always some emotional involvement in a situation like this and this is very difficult to determine the level of it but I tried to be as objective as I could.

21

22

MR. LABOW: Thank you, Doctor. I have no further questions.

23

24

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THE COMMISSIONER: Yes, all right,



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thank you, Mr. Labow. Mr. Shanahan, I see you rising.

3

Have you got consent from your betters?

4

MR. SHANAHAN: I have asked them,

5

Mr. Tobias and Miss Jackman, and they don't seem to

6

mind.

7

THE COMMISSIONER: Yes, all right.

8

CROSS-EXAMINATION BY MR. SHANAHAN:

9

Q. Good morning, Doctor. My name

10

is Shanahan and I act for the parents of the Lombardo
and the Dawson children.

11

A. Yes.

12

Q. I wonder if the doctor could be

13

given the chart for Stephanie Lombardo, which would
be Exhibit 78.

14

Now, Doctor, all I am really going

15

to do to a large extent here, a lot of the ground I
was interested in covering has been already covered,

16

17

so, we will leave it at that, but I was going to tie

18

a few threads together here if I might. One area, sir,

19

that I would like you to look at here is the report

20

of the surgery itself that was done on young Baby

21

Lombardo, and that is when the shunt itself was

22

actually put in. That was contained on page 75, sir,

23

if you can locate that. Do you have that there in

24

front of you?

25



H.4

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2

A. Yes.

3

Q. If you have got the same thing

4

I have it is a report under the name of a Dr. Painvin.

5

A. Right.

6

Q. All right. That describes, sir,

7

the operative procedure. It tells the position

8

and what-have-you:

9

"The sternum was opened."

10

Line 2:

11

"The pericardium was opened also.

12

The size of the main P.A. was 4
millimetres in diameter. The size

13

was too small to work with a

14

prosthetic graft as we had expected

15

to do. So we decided to do a window
between the ascending aorta and the

16

P.A. We did it in the usual way,

17

and the lumen of this window was 2.5

18

millimetres. We noticed an improve-

19

ment in the systemic PO₂ rising from

20

27 to 47."

21

They say it was closed and what-have-

22

you, the tubes were put back in and that next sentence

23

concludes:

24

" ... the patient was closed in the
usual manner."

25



H.5

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And then comment:

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"She was sent to the ICU in bood
hemodynamic status."

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It summarizes in the last sentence
of the summary, after telling about the finding of
tetralogy of Fallot and putting in the of the shunt
it concludes:

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"She underwent this operation
without problems."

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Now, coming along, sir, if you could
move forward, on page 36 there are some more notes,
if I might. Do you have that located, sir?

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A. Yes.

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Q. On the bottom right-hand corner
there is some handwriting here, dated the date of
that operation.

16

A. Yes.

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Q. The 17th of the 12th month.
OR, I take it it is Dr. Trusler reporting from the
Operating Room?

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A. Yes.

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Q. And he says that there is a
tetralogy of Fallot, as I translate the shorthand
there.

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A. Yes.

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Q And PS would be what, pulmonary shunt or pulmonary ...

A Window.

Q All right.

A I don't know.

Q And then below that it says the operation is a pulmonary window of 2.5 millimetres. PO₂ from 22 to 47?

A Oh, that was pulmonary stenosis, I am sorry.

Q All right, I am sorry. And then after the window is put in, the shunt is put in, the PO₂ goes up from 22 or 21 to 47.

Now, first of all, sir, as you see the operation report there and Dr. Painvin, would you feel there, sir, or at least I would gather from that that the child came through that operation in normal fashion from the operation itself, although they were met with a smaller than average size shunt they seemed to respond to it on their feet right in the Operating Room in the normal fashion?

A Yes, she seemed to have gone through the operation quite nicely.

Q All right. The very fact, sir, that at her age she would be considered for an



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operation such as this sort, the fact she would survive it, the fact that she would be transferred to ICU some days later, all of these would be factors which would indicate that she was stable, she was progressing satisfactorily after the operation. Would that be a fair assumption, would you say, on reading those records?

A. Well, I don't think one should minimize the problem here. I think it is still a very serious problem and that the baby had this shunt, which was felt to be small and the reason for that was that the pulmonary artery was small.

So, I would say that the baby was doing reasonably well but it was still a sick baby.

Q. All right. But, sir, you will agree that she wouldn't have been moved from ICU to the ward unless she was out of immediate danger. Am I right there?

A. I would say that that is usually the situation, yes, unless they are short of space or some other very pressing problem.

Q. And the operation itself obviously caused an immediate rise in the PO₂ and that in itself would be a good sign, it would show some measure of success. Am I right there?



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A. Yes, you are right except that you have to be very careful in interpreting this PO₂. You may have gotten later PO₂'s which would be a little bit different. So, you have to have a series of them really to be able to rely on them, you can't rely just on one.

Q. All right. Well, later, sir, page 38 is a note, it is done by a doctor when she is about to be transferred and it tells about the condition TF, window put in, heparin started.

It says, as I interpret it, it says the murmur is systolic, heparin has been started there, stable in 40 per cent O₂, PO₂'s in the 40's, UO good. I have asked this before and I don't remember, but UO, do you know what that stands for?

A. No, I don't know.

Q. Output is good.

A. Oh, yes.

Q. All right. PO₂'s in the 40's. We have another indication there, sir, that some five days later this doctor considers, and we will go on to the rest of the comments there, but at least he considers with respect to PO₂'s, that they are in the 40's and she seems to be stable enough to be considered for a transfer to the ward. Now, that is



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five days later, sir. Would that not again indicate that the operation had been to a large extent successful?

A. Are you referring to the same note on page 38?

Q. 38, sir.

A. This is not five days later, is it? This is only two days after the operation.

Q. I'm sorry, sir, two days, the 17th to the 19th.

A. Well, I think again you have factors which speak in favour of the child being reasonably well but other factors which speak against it. For instance, they would not have started heparin if they did not feel that the shunt was small. So, that is an indication. PO₂'s in the 40's are reasonably good but they would be better if they were in the 50's, or at least in the high 40's.

Q. Dr. Rowe - not to interrupt you there - Dr. Rowe used exactly those two words in his transcript, reasonably good.

A. Yes.

Q. Stated too high or too low but he stated reasonably good.

A. Fine.



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Q. Further on in that note, sir, it says that her colour was pink, dusky when cries, no distress, and below that child's colour and PO₂, and there is an arrow pointing upwards, so, I take it it is upwards, sir, one must assume reasonable shunt function, and then it talks about nutrition and things of that nature; the last line, candidate for transfer to the ward.

I don't want to push you too far but it seems to me, sir, that, and I know she had a serious operation, but it seems to me that some of the indicators that they are looking at on the 19th as to whether she should be transferred from ICU to the ward, they seem to feel from her urinary output, her colour, her nutrition, PO₂, it seems to me that you could say that Stephanie Lombardo seems to have sustained that operation and be progressing?

A. That appears to be the situation.

Q. All right. Sir, would a child such as this always be put on heparin as a precaution or in your experience does the heparin indicate to you a real fear of the shunt occluding?

A. Well, there of course it depends on the hospital. There are some hospitals which will routinely place a child like this on heparin.



H.11

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Q That is what I wanted to get at.

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A Following it. I'm not sure about the policy of this particular hospital, The Hospital for Sick Children.

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Q All right.

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A I know that they often use it but whether they always use it I'm not sure.

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Q In some instances after a shunt operation out of an excess of caution heparin is routinely given in any event, am I right there, in some hospitals?

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A Yes, there are hospitals where the heparin is routinely given, yes. But I am a little bit surprised that they started the heparin here a day later.

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Q Yes.

A And I wonder whether there was an additional reason that made them feel that they should start it at that particular time?

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Q I was going to ask you that. The heparin is started on the 18th, the operation itself was done on the 17th. It would seem to me, as I gather from the first note I read you, that the operation had been performed in the usual manner. It would seem to me, sir, that putting her on heparin



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a day later, that if there was a real concern about a very small shunt and a real concern about a possible immediate occlusion, that right after the operation, immediately, one of the orders would be, put her on heparin immediately. I read, sir, that the putting her on heparin a day later is really putting her on heparin out of an excess of caution and not so much from a real concern that it is so small it is about to occlude?

A. Well, there could be other interpretations. For instance, you may be concerned about putting her on heparin immediately after surgery because of bleeding.

Q. All right.

A. You are concerned about bleeding, so, you wait and then put her on heparin later. So, there are different approaches as far as using heparin and I'm not sure exactly what the system is here. Perhaps the surgeons or the cardiologists from the Hospital will be in a better position to answer this question.

Q. All right. Finally, sir, the dimensions that you were given with respect to the size of the shunt and the size of the artery, are they really useful in you being able to assist us as



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to whether this is categorically a small shunt, a medium shunt or a large shunt or once the body is shut up will the pressure of the heart and the body around it alter the very size of that shunt; in other words, we are told it is 2.5 millimetres I think?

A. Yes. I think the indications are that the pulmonary artery was small and that this shunt is on the small side and that the PO₂'s, as I indicated earlier, are the best indicator during life of the size of the shunt and I think reviewing those may be helpful. I don't have them, I don't know exactly where they are.

Q. Sir, there are, starting on page 98, sir.

A. Yes.

Q. It picks up on December 15th.

A. Right.

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Q. It picks up on December 15th.

A. Right.

Q. There had been additional notes given us, sir, that go back as far as December 13th, and I don't know if they had been placed in your book there.

THE COMMISSIONER: It is Exhibit 78-B and you will find several pages attached to page 98.

THE WITNESS: Oh, yes, I think, so.

Q. So, if you have those extra pages they, in fact, go back as far as December the 13th?

A. Yes.

Q. And they bring us forward right through to the 15th and right up to some samples actually taken, as we have found out, about ten minutes into the arrest on December 23rd.

A. Yes.

Q. If you could range through those p02's for a second and tell us after the operation what you think of those p02's.

A. The date of the operation was the 17th?

O. Yes.

A. So most of these that I see here



are prior.

Q. Yes, but following there
on page 98, 99, 99 is the 16th and the 17th, sir.

A. Yes.

Q. And the 17th at 1340 hours
we have -- I don't see pO2's taken any of the
17th or the 18th or the 19th, I don't see pO2's
there at all.

A. I don't either, not after
surgery.

Q. Would you not think that would be
something in terms of watching whether this shunt
was effective or too small, would that not be
a piece of information that really would be crucial?

A. Yes, I would agree with you, but
I would be quite certain that they would have done
them but they are not registered here for some
reason or another.

Q. Finally, then, sir, with respect
to the manner of her death and the terminal events.
Would a shunt that occluded, whatever about the
suddenness of the death it might cause, would it
actually, death by occlusion of a shunt, would it
cause arrhythmias and the fibrillation problems that
young Lombardo exhibited?



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A. Yes, they could.

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Q. It would?

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A. Because the terminal events

5

very often will be complicated by arrhythmias.

6

Now, they would not cause -- it would not cause

7

long standing arrhythmias, it would not cause

8

arrhythmias that would persist for long periods

9

of time, but it certainly could cause arrhythmias

10

Q. Bearing in mind a child who

11

hasn't had any arrhythmias prior to that, sir,

12

as a layman it struck me that if you are talking

13

about a shunt occluding, and that is being blocked,

14

the death I could understand could be very sudden

15

because the blockage would lead to a complete

16

cutting off of the flow of blood; but it would strike

17

me that arrhythmias would be the exception and not

18

A. I would not go so far and

19

state that because, for instance, when a shunt occludes

20

a child becomes hypoxic, sinus bradycardia would be

21

quite a common situation, and the hypoxia also

22

sensitizes the heart and then drugs are given during

23

resuscitation and many types of arrhythmias could

24

occur at that particular time, that is very terminally.

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Q. All right. Bearing in mind,

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sir, a shunt operation here, would you say that the

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digoxin for this child, any digoxin, let alone a toxic

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dose, even a therapeutic dose of digoxin would be

6

detrimental and harmful to this child in the condition

7

that she had?

8

A. I should perhaps explain this.

9

Usually in a child with a tetralogy of Fallot

10

digoxin is contraindicated.

11

Q. That was the word I was going

to lead up to, "contraindicated"?

12

A. Yes.

13

Q. All right.

14

A. In other words, it could be

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harmful. However, following a shunt operation like

16

this sometimes digoxin is given. It is usually only

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given though when one expects or suspects that the

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shunt is too large, is very large and therefore

19

causing a large pulmonary blood flow and an overwork

of the heart, this overworks the heart, thus digoxin

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will support the myocardium.

21

Now, this is not the situation here

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where the shunt was felt to be small, and therefore

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one would not have to worry about the heart being

24

overworked, and thus I see no indication for digoxin.

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2 I can see that perhaps some cardiologist would
3 digitalize all these children who have a shunt
4 operation just as a precaution, as a precautionary
5 measure, I am sure that happens in some places.
6 I don't believe that it would be the case here, but
7 I am not sure.

8 Q. Actually, following your
9 logic in fairness wouldn't it be exactly the
10 opposite here, if it is ever given after tetralogy
11 of Fallot it is given when you have a very large
12 shunt and the flow through is a large volume of
13 flow. Would not the case of Lombardo, as you have
14 laid the ground rules there, be that for Lombardo
15 digoxin, even a therapeutic dose, would really be
16 quite detrimental and contraindicated?

17 A. Yes, in my view it would be
18 contraindicated from the findings that I see.

19 Q. Contraindicated would be
20 detrimental to her?

21 A. It means it could be harmful,
22 it is not necessarily harmful, but it could be.

23 Q. In terms of the toxicology
24 if I can sum up here, with respect to Lombardo would
25 it be fair to say, sir, that in Lombardo, and it is
something that you comment on here, with Lombardo you



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have got substantial quantitative findings of
digoxin in the body, is that correct?

4

A. I have to look it up, excuse
me just a second; this is from the exhumation you
are talking about?

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Q. Yes.

7

A. Yes.

8

Q. You have the findings again in
contrast, we will say, with other children, you have
the other findings widespread throughout the body,
myocardium, lung, liver, muscle, chest fluids,
bowel, stomach, isn't that correct?

12

A. Yes.

13

Q. You have with Lombardo as well
all the techniques, the RIA, the RIA/HPLC and then
mass spec. which, if analyzed, would convey to us
with certainty that we are dealing with digoxin and
no digoxin-like substance, that is correct, isn't
it?

18

A. Yes.

19

Q. You have in readings in Lombardo,
as you indicated in the stomach, the stomach reading
of 6 to 9 nanograms is higher than even the Cook
child, the contents of the Cook child, the stomach --

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A. Oh, much higher, yes.

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Q. I believe as well with respect to Belanger there is a comment made of Belanger the child's liver had 253 nanograms, and again here Lombardo has 354, and again we are considerably higher even than the Belanger sample.

A. Yes.

Q. I think the comment you made in this report here, the report of September 13th with respect to that was that that indicated to you vis-a-vis the Belanger child that there was certainly more than one therapeutic dose given to that child.

A. Yes.

Q. I think in fairness to you, sir, you also indicated to sum it up with Lombardo, you felt not only was there the mere finding of digoxin which caused you concern, but as well as that you felt quite clearly it was more than the therapeutic dose had been given to this child?

A. Yes.

Q. Now, sir, doesn't Lombardo really go a step further? Lombardo, if I can tell you, sir, was not embalmed and was not autopsied. As I understand it, and quite clearly, the autopsy procedure itself would involve the cutting open of the body, cutting open of organs, arteries, and



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2 the disturbing of the body itself. The embalming
3 procedure, I am really not familiar, but certainly
4 there is foreign or different fluids which may
5 affect digoxin, and these fluids are put into the
6 body.

7 A. Right.

8 Q. And I will put to you, Doctor,
9 that the fact that the Lombardo child's body is
10 left intact after death, and then interred intact
11 until the exhumation, that really your findings in
12 Lombardo in terms of confusion because of embalming
13 fluids; your rate of dehydration; really the
14 Lombardo child enjoys, if you like, even more
15 certainty in the readings because the child has not
16 been embalmed and has not been autopsied.

17 A. That is correct, except I would
18 not try to evaluate the rate of dehydration because
19 that is very tricky, difficult situation to do.

20 Q. Although not able to evaluate
21 it, sir, you will agree that although exhumed
22 so many months later, that we have, and I think your
23 comment was you didn't like, you were concerned about
24 the quality of the sample of test fluid. Again
25 to my mind, what I found significant, sir, was the
mere presence of a significant amount of chest fluid



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2 here that revealed then a 2 to 5 nanogram reading,
3 that the mere presence of chest fluid would indicate
4 that this body was not significantly dehydrated.

5 A. The body was obviously not
6 dry, but how dehydrated it was is very difficult to
7 really state without a weight. As I indicated earlier,
8 if you had a weight, the simple weight of the body at
9 the time of death and then could compare with the
10 weight at the time of exhumation, that would have been
11 very helpful.

12 Q. It would have been very helpful,
13 it would be a better indication.

14 A. It would be a very good
15 indication.

16 Q. But you do agree the mere
17 finding of significant amounts of chest fluid,
18 quite apart from the fact that they also give us
19 readings of digoxin, the finding of fluid there and
20 the fact she is not autopsied and not embalmed,
21 I would suggest to you, sir, leads to a greater
22 confidence in her readings.

23 A. Yes.

24 Q. Dr. Kauffman in his report,
25 sir, and this is Dr. Kauffman's report, Page 307, and
I am just going to read it, it is very short, Mr.



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Elliot, and I don't think you will need it. He is commenting about the reliability of exhumed and embalmed tissue. He feels there are a number of factors which could have the effect of perhaps reducing the amount of concentration, and I am reading from that page:

"Digoxin assays in exhumed, embalmed tissues present several additional problems. First, digoxin has been shown to be unstable in at least one embalming fluid and undergoes a significant amount of chemical segregation over a period of months."

Would you agree with that?

A. Yes.

Q. And then applying it to Lombardo, again as I pointed out she hasn't got that embalming fluid; and as well as that the chemical degradation would lead to what he seemed to imply here, where he doesn't imply, he states it in the next sentence:

"This would have the effect of reducing the apparent concentration of digoxin."

A. That is correct.

Q. "Second, nothing is known about



Hastreiter, cr.ex.
(Shanahan)

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the degree to which digoxin tissue binding is altered by post mortem changes and to what extent the drug re-equilibrates in post mortem tissues." You agree there?

A. Yes.

Q. "And, third, desiccation of the tissues occurs to varying degrees with time depending on burial conditions and may potentially result in erroneously high apparent concentrations of digoxin."

It seems to me there were two factors which would speak to lowering the readings, and that would be the leaching out of tissue and the uncertainty of embalming fluid and degradation with time.

The one factor that might drive these readings up and make them unreliably high would be the desiccation, the dehydration of the three that I mentioned to you there, would you agree?

A. Well, the second factor, the release of digoxin from tissues, is rather complex because it may release it more from the higher concentration tissues, so it would decrease the concentration there but it will increase it in the fluid surrounding it, like blood, and possibly



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2 it could equilibriate with the lower concentration
3 tissues and make them higher, so it is a rather
4 complex situation.

5 I don't like to speculate too much on
6 what this does because I don't have any real data on
7 it.

8 Q. Knocking out that and leaving
9 it as neutral and as we will say, difficult to
10 interpret, and the one factor was that it would
11 later then be unduly low, and one factor might
12 lead to it being unduly high, the desiccation, by
13 dehydrating.

14 A. Yes.

15 Q. What is left in the tissue is
16 an unreliably high reading?

17 A. Right.

18 Q. But you will agree, getting back
19 to the point about Lombardo, that amount of
20 desiccation and dehydration doesn't appear to have
21 taken place.

22 A. That would be my feeling, yes.

23 Q. Finally, sir, I think to my
24 friend yesterday, Mr. Olah, you said you felt that
25 because of the contents in the stomach, if I heard
you right, and the bowel, you thought with Lombardo



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it was probably an oral administration that was
given to her.

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A. I'm not sure those were my
exact words, that I would like to perhaps -- do we
have that?

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Q. Rather than me putting it
to you, if I have taken it wrong, can you tell me
what you think, do you think it was probably given
intravenously or do you think because of the
contents of the stomach you felt that it was given
orally? All right, maybe I will try and locate it.

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A. Okay.

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J/BN/ak

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THE COMMISSIONER: The note I have is the finding of digoxin in the bowel does not mean much. No, wait a minute, the finding of digoxin in the bowel -- in the stomach it is quite high and means more.

MR. SHANAHAN: Q. Yesterday's evidence was in Volume 80, and at page 7483 you have an answer, sir, to a long question that starts on page 7482.

A. Which volume is it?

MR. HUNT: Mr. Shanahan, perhaps the witness can examine it.

MR. SHANAHAN: Do you have that, Mr. Commissioner?

THE COMMISSIONER: Well, I am not going to say yes or no. The answer is yes.

MR. SHANAHAN: Q. Page 7482, sir, about line 11. Perhaps the previous answer, you state:

"A. Yes. Okay. The finding of digoxin in the bowel does not surprise me, and I do not think it helps in any way to determine whether the medication was given by mouth or intravenously or other routes. This baby was



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"not supposed to have received any,
is that right?

Q. That is correct, Doctor."

And you continue with your answer:

"A. The finding of digoxin in the
stomach is a little more surprising
perhaps because the amount here is
considerably higher than it was in
Cook's case. In Baby Cook it was
only 34 nanograms in the stomach and
here we have 629.

So I think there are two possibilities.
One is that assuming that the drug was
not given by mouth, that the drug was
excreted into the bowel to the vial,
and then may have reflexed..."

A. No, through bile, b-i-l-e.

Q. "...and then may have reflexed
back into the stomach, that is a
possibility."

A. Refluxed, r-e-f-l-u-x-e-d,
refluxed.

Q. All right, I did not type
this, Doctor.

A. No, I am just ---



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Q. "I am not sure it is a very likely possibility with the amount that they have in the stomach, which appears to be a fairly large amount.

So, I was trying to calculate -- let us say if this child had received just one maintenance dose of digoxin for her weight, and assuming that she is getting, let us say, 10 micrograms per kilo per dose, which is a pretty big dose, she would have received -- she weighs only $2\frac{1}{2}$ kilos, so it would be 25 micrograms, which would be 25,000 nanograms. Of these 25,000 you find 600 in the stomach. That is approximately, I would say $1/40$ th of the total amount given by mouth.

So, in summary, I would say it does not help completely separate one or the other route."

Now, this was the area that perhaps I latched onto.

"It probably makes the oral route, the possibility of oral route fairly high."



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A. Probability.

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Q. All right.

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"That is as far as I can go, I think."

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Now, sir, I do not want to take it any further than that, but we have heard, sir, about the possibilities of error here. We also know that young Lombardo is only on one drug, and that drug is heparin, and that drug is being given intravenously.

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Now, quite apart from the many smaller errors that would have to be made to give Lombardo digoxin, depending on who else was in the room, other children, whether they too were taking digoxin, if this digoxin was given orally, would not two massive errors have to be made here and two, I would put to you, unlikely errors. One would be the giving of the digoxin at all to her when it was contra-indicated, and second of all, in case the scenario might be put that, well, instead of the heparin being put into the IV that the dig. might be put into the IV. The second huge error that would have to be done here would be bearing in mind that no drugs are to be given to this child orally at all, (a) digoxin would have to be gathered up, and then (b) it would have to be administered, if we accept your scenario/^{or} the probability of it, it would



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have to be given orally to her when nothing else bar
her feed was to be given orally to her?

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A. That is assuming that it was
given orally, you know, we cannot completely state
that it was.

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Q. But assuming it was on the
basis of your qualified response there yesterday,
you would agree that those two errors would have
to be made?

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A. Yes.

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Q. All right. Finally, sir,
I think you said that that oral dose would have to
be given somewhere around 1:30?

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A. Yes, two hours prior to the
onset of symptoms. I do not remember the times,
but ---

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Q. All right. The last notes
here, sir, on page 41 are the notes prepared that
last evening by Nurse, I think it is Ganassin-- she
may correct me if she shows up, but it looks to be --
and they start, sir, on page 41 of Lombardo's notes,
if you have them in front of you, of her records.

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They are the notes from 1900 hours
of the 22nd into 0330 hours of the 23rd:

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"Patient relatively stable. Heparin

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"infusing well. Patient feeding
eagerly, 1½ to 2 ounces..."
and I do not know what the next indication is.

"Apex 144 to 152 and regular. (Some-
thing) 50 to 52 shallow but in no
distress. Colour pink. (Something)
dusky when upset. Became restless
after second feed, however settled
well."

First of all, again, there seems to be a pretty
stable child there?

A. Yes.

Q. It would appear that there
was a feed early in the shift of 1½ to 2 ounces
and then a second feed, afterwards she became restless,
and then the next note is 3:30 when we are into the
final placing on a cardiac monitor and a Code 25
being called. If that second feed, sir, was of
the same size as the first feed, that is 1½ to 2
ounces, could it be that this child was given the
digoxin in that second feed?

A. Do you know what the time of
that feed was?

Q. I intend to ask Nurse Ganassin
that, but that is assuming that it was before 3:30,



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and these are some assumptions, but if there is one feed around 1900 and another feed, the child fed an hour or two or two and a half hours later, I would submit it would take it back around that 1:30 to 2 o'clock time frame that you have given us.

A. If it were between 1:30 and about 3 o'clock or so, I think the time would be right.

Q. Can you tell us the amount that would have to be given orally? What I am really getting at is this: would it be enough that could be given in a feed of 1½ to 2 ounces or would the child reject the feed or it would be a volume that would be just outrageous that the child could not take it all?

A. Oh, there is always a possibility that it could have. For instance, you could have used the intravenous preparation, which is a small volume, and put it in a bottle. Even if you had used the oral, the elixir, pure oral, 2 ounces of that, it is about 60 millilitres, I believe, would be 3 milligrams. That is a big dose.

Q. All right. But if you use the intravenous amount and put it into her feed, this child is apparently feeding eagerly, you could



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put that into the 2 ounces and feed it in the bottle
then.

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A. Yes.

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Q. I am finished with Lomardo, sir.

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I have just a few minutes on Dawson.

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THE COMMISSIONER: What is your
situation this afternoon?

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MR. SHANAHAN: I am not here at
2:30, so would my friends bear with me?

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THE COMMISSIONER: All right. There
is not much danger with my girth of starvation, but
if anybody else starves, they have a cause of action
against you, that is all.

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MR. SHANAHAN: All right.

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Q. Sir, with respect to young
Dawson here, as I summed up her situation, a child
of 11 months, had had an initial banding operation,
had gone home, had returned to the Hospital, had
the banding taken off and a patch put in a hole in
her heart, it left a frenic nerve paralysis, but
she goes home again for a period of months and while
at home is being given digoxin by her mother. She
is brought back to the Sick Children's Hospital not
because of any precipitating event but because of
what is called a failure to thrive.



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Would that be a fair summation of what
you recollect about Amber Dawson?

A. Excuse me just a second. Yes,
that seemed to be her main problem.

Q. There was no -- she was in
Hospital five days. There was no surgery done.
There was no surgery immediately scheduled, and
Dr. Rowe, at Volume 12, page 2124 and following says
that she was not at imminent risk and he said her
decline, he felt, was sudden and unexpected. Would
you agree with that, sir?

A. Excuse me a second here. Yes,
I know that I placed her in the fair category,
indicating that there was some degree of -- you know,
that the decline was somewhat unexpected.

Q. Could I put to you, sir, that
it was unexpected enough that in this early stage
of the time period we are covering that somebody at
the Hospital felt her death sudden enough and
unexpected enough that the coroner, quite apart
from the parent just being approached for an
autopsy, that the coroner was notified and brought
in on this death? Would that not also be a factor
that you would consider in terms of how sudden and
how unexpected her death was?



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A. Yes.

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Q. All right. If I could ask

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you, sir, and I am trying to relate this to the

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symptoms you have described as those that character-

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ize digoxin toxicity, and if I could ask you to look

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at page 80 of Dawson's records there, these are --

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sorry, have you located them, sir?

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A. Yes.

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Q. I think, sir, they are about

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on the day -- they are, sir, they are on the day of

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her death, the 27th, and about the middle of the page

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there under "Behaviour", "continues to be lethargic"

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under "Nutrition", "Dr. Reynolds notified re babe's

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poor nutritional status and lethargy." Obviously

she is lethargic enough that he is told about it.

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Page 85, sir --

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A. Yes.

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Q. At the top of that, again

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under "Behaviour", "Appeared drowsy, slept continu-

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ously between feeds." That is two days before, on

the 25th. Dropping down, sir, to the 26th at the

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bottom:

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"Behaviour - very lethargic all

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evening. Limbs appear almost floppy

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at times."

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On the following page, page 86 on the 27th it appears to be, where the new set of writing comes in around line 9, as being lethargic in the course of the day, not interested in feeds, has vomited twice.

In the terminal events, sir, on page 84, the notes by the resident there on the third line, he says that there is sudden recent deterioration. I take it the arrow means leading to collapse.

A. I am sorry, what page is this?

THE COMMISSIONER: 84.

MR. SHANAHAN: Q. 84, sir.

A. 84. Oh, I see, yes.

Q. Initial condition -- I think this is what it is: initial condition, gasping spontaneous, extreme bradycardia.

I would submit to you, sir, here that she displays -- I appreciate that digoxin toxicity has what we have heard called non-specific symptoms, but I would submit to you, sir, that the the fact lethargy leading to/that she is almost floppy, that the vomiting which is, I would submit to you, extreme and I will give you more evidence of that in a minute, that she displays the classic symptoms here of digoxin toxicity?

A. I am not sure I can agree



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3 with you here because the lethargy that you describe
4 and the floppiness go back to the 25th, and she died
5 on the 28th in the morning, I believe. I would not
6 expect this to be -- you know, even if you had, let
7 us say, a therapeutic digoxin overdose, which would
8 be either that the baby was very sensitive to the
9 medication or that the dosage of the medication
10 given therapeutically was high, lethargy, floppiness
11 and things like this are not exactly very character-
12 istic. It would be characteristic of an acute
13 effect, if you had given her a big dose at once,
14 then terminally she would become lethargic and
15 floppy and so forth. But I think these symptoms
16 are very, very vague. They could be associated with
17 many, many other reasons.

18 Q. All right. Would it assist
19 you that three days before, to be fair to you, sir,
20 is the last reading we have of serum digoxin, and
21 that reading is 1.9?
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A. That is an acceptable level.

Q. All right. Finally, sir, then the autopsy report. It seems to me from your report of the meetings of September 13th - well, it doesn't seem, it says there - that you have reviewed the autopsy and yet Dr. Fay, who was also at the meeting, said he hadn't seen the autopsy report. Do you have any better recollection of whether you had seen, and it is in the document you have in front of you and we will look at it in a minute, do you have any specific recollection with respect to Dawson that you saw the autopsy report that flowed for the coroner's investigation?

A. I have no specific recollection.

Q. All right.

A. I have said that I read it, so, I must have read it.

Q. Page 63 of those records that you have, sir, is the part of the autopsy report - this is the last area here - part of the autopsy report that I would like to direct you to, sir. Do you have page 63?

A. Yes.

Q. All right. First of all, on the stomach the doctor notes, and that is about the



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third topic from the top:

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"Stomach: Sections through the area of perforation shows hyalinization and thinning of muscular coat. In areas adjacent to the rupture, the blood vessels are distended and there is interstitial hemorrhage."

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What he has found earlier, if you will accept it, is he has found a perforation in the stomach lining.

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"Summary of Abnormal Findings" in paragraph 7:

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"Autopsy showed that the surgical repair of congenital heart defects have been successful. Ventricular and septal heart defects have been closed and appeared intact. There was a trivial deformity of the pulmonary valve. Microscopic examination revealed area of old myocardial fibrosis, consistent with ischaemic changes. Gastromalacia perforation of cardia was a recent event most likely precipitated by vomiting. There was evidence of pulmonary



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that:

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And then he gives contributing factors.

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digoxin toxicity?

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"collapse, but no pneumonitis was found. The presence of focal periventricular leukomalacia is consistent with old ischaemic insult."

And then the "Cause of Death" below

"The immediate anatomical cause of death was not determined."

Now, sir, I put to you again,

reviewing in terms of her displaying the symptoms of digoxin toxicity, as I read it here, that her vomiting was so persistent in the last few days, it is noted in the records of the nurses, that you have a defect or a perforation here that this pathologist says was caused by the vomiting, that I put to you that the vomiting is severe and persistent and seems to be the type of vomiting that would be induced by digoxin toxicity?

A. Again I should say that I know of no instances where perforation of the stomach was attributed to digoxin.

Q. Contributed to vomiting?

A. Contributed to vomiting which contributed to digoxin.



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Q And the vomiting contributed
to the digoxin?

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A Clearly digoxin will produce
vomiting but as far as I know, at least I am not
aware of any instances of perforation of the stomach.
I think much more likely the perforation of the
stomach originates or results from a so-called stress
ulcer which happens in babies sometimes when they
are stressed very severely.

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Q Would it be significant to you,
sir, if there were evidence to come that in fact
during the previous lifetime when on therapeutic
digoxin at home that these symptoms of extreme
lethargy, floppiness, vomiting, persistent and
violent vomiting, that they weren't present when she
was on therapeutic digoxin and that they were present
in the last five days and the pathologist indicates
finally the vomiting caused a hole in the stomach
lining, and Dr. Rowe thinks that may have precipitated
that.

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A So what is the question?

Q Well, the question is then,

that these symptoms, the lethargy, the vomiting, the
floppiness leading to the perforation of the stomach,
that they exhibited themselves in the last five days'



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stay at the Sick Children's Hospital and that therefore she may have received or could have received there a toxic dose of digoxin?

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A. I find it very difficult to attribute it to digoxin unless she had received it earlier, several days earlier before she died, and that I don't quite see how it could have killed the baby. I mean, it would be sort of a chronic type intoxication rather than an acute terminal intoxication.

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Q. All right.

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A. To me, that is not a very practical situation really.

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Q. Isn't the problem with Dawson and that scenario in fairness, Doctor, that we don't have the distribution in tissue. When we have the readings that Mr. Cimbura gives us later that we don't have the readings to support this baby having received an overdose of digoxin. In fact, the readings I think are probably consistent with a therapeutic maintenance dose over a period of time?

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A. I would have to review the source of these tissues. I am not sure what tissues they were. I have them here I think.

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Q. You have them in your report at page 235 of the meeting of September 13th in heart,



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they are between 15 and 19, in fixed and in lung
they are 19 and fixed.

A. And these were fixed tissue
specimens?

Q. That's right.

A. So, I really cannot say very
much about them except to say that she was receiving
digoxin.

Q. They are consistent with
therapeutic digoxin?

A. Oh, certainly.

Q. That is what I am saying. So,
in other words, there really isn't the toxicology here?

A. No.

Q. Toxicology data to support
Dawson having received a massive overdose?

A. No.

Q. All right. Finally, is there
though, would the toxicology elude us if she in fact
received a massive dose towards the end but it did
not have time to distribute into tissues? We don't
after all have a blood reading up until three days
prior to her death. Is that a possible scenario?

A. Sir, the question again?

Q. Bearing in mind that our last



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blood reading for digoxin in Dawson is three days before death and it is 1.9, the only ting we have after death is the fixed tissue that I have just quoted to you.

A. Yes.

Q. Could there be a massive overdose in digoxin that didn't have time to distribute?

A. There certainly could. There could also have been a massive overdose that had distributed. I don't think that the tissues help us in one way or another.

Q. And we don't have the data to support that, I am prepared to concede it.

A. Because we have only fixed tissues and we have values which are within what we would expect therapeutic range.

Q. But a massive overdose with death before distribution into tissue would only be detectable if we had a blood serum reading?

A. Well, if you had a very high myocardial level for other tissues it probably would support it, indicating of course distribution. But, yes, the blood is a very critical finding.

MR. SHANAHAN: Thank you, Doctor.

THE COMMISSIONER: Well, I think we



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(Shanahan)

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had better come back at, well, I will give you five
minutes' grace, 2:35.

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--- Luncheon adjournment.

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--- On resuming:

THE COMMISSIONER: Mr. Tobias, have you and Miss Jackman sorted out your lives?

MR. TOBIAS: Yes, I believe Miss Jackman is going to proceed and I will bring up the rear.

THE COMMISSIONER: Yes, all right.
Miss Jackman?

MS. JACKMAN: Yes.

CROSS-EXAMINATION BY MS. JACKMAN:

Q. Good afternoon, Doctor. I am Barbara Jackman and I am representing one of the members of the Trayner team, Marianne Christie, a Registered Nursing Assistant.

A. Yes.

Q. I don't have too many questions of you.

Doctor, the first thing I wanted to refer to was Baby Bilodeau. We have a copy of minutes of a meeting of August 27th, 1982, Exhibit 269. Have you seen those minutes?

A. Yes.

Q. You were present at that meeting?

A. Yes.

Q. Did you receive a copy of the minutes?



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A. Yes.

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Q. So, would that be true with all the other meetings you were in, that you received copies of the minutes?

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A. I believe so, yes.

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Q. Okay, Doctor, on page 2 of those minutes at the bottom, the second-last paragraph, there is I guess a description of what took place in the meeting in terms of what you had said. The last sentence in that I believe is attributed to you stating that Bilodeau was not murdered and that there is no evidence that he was. Then, Doctor, I want to refer you again to Exhibit 261, which is the September 13th meeting.

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A. Yes.

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Q. At page 239, again with reference to Baby Bilodeau.

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A. What page would that be?

Q. Page 239.

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THE COMMISSIONER: Page 21.

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MS. JACKMAN: Or page 21.

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THE WITNESS: 21, I see.

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MS. JACKMAN: Q. And at the top of that page it states:

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"Dr. Hastreiter reviewed the medical

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"history of this child; progressive
downhill course. Natural."

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So, Doctor, what I don't understand
in light of your comments at the August 27th meeting
and your statement at the top of that page is why you
categorized this baby as low suspicious?

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A. I would have to review the case
a little bit, I don't remember the details. If you
give me a minute.

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Q. Baby Bilodeau was the baby with
truncus arteriosus and truncal stenosis, and I believe
it was 30 days old when he died. You gave him a
severity rating of 9. Actually, Doctor, I believe
your own rating was small in your report with respect
to digoxin intoxication?

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A. Well, I think the explanation
should be as follows: I reviewed Baby Bilodeau from
a clinical standpoint and thought that the baby's
death could very well be explained on the basis of
his findings, cardiac findings, the severity of the
heart disease, clinical course, et cetera.

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Then we had that meeting on August
27th and I more or less expressed this opinion. It
says here that I felt it would have been very unlikely
that this baby would have been murdered with digoxin.



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2 However, I cannot be, you know, responsible for the
3 wording here. I think that some of the wording here
4 may be a little bit different than what it actually
5 was. I'm not sure because I don't see how I could
6 have said that. I did not say that Bilodeau was not
7 murdered, I'm sure about that, because I wouldn't, it
8 would be very difficult for me to make such a statement.
9 However, the index of suspicion was very, very low.
10 In fact, when I attended the meeting on September 13th,
11 this was my opinion, because when I first started
12 describing the case, my impression was that it had
13 been a natural death, but as I said earlier, the
14 purpose of this meeting was to get everybody together
15 and try and come to a final opinion about the
16 situation, whether or not there was no suspicion, low
17 index of suspicion or a higher index and I believe
18 with the evidence which was then added and provided
19 I changed from a natural to the next category which
20 will be suspicious; in other words, I couldn't rule
21 it out completely; which I never thought I could.

22 You see, of course, when you
23 categorize somebody in the natural group that means
24 your index of suspicion is extremely low and you can
25 almost exclude digitalis toxicity. You can never
totally exclude it in any case I don't think. So, it



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is a matter of degree again and I don't know the exact circumstances which led me to change, I think it must have been the toxicology or the review of the toxicology with Mr. Cimbura at that time.

Q. Could it also have been, Doctor, the discussion by the other participants at the September 13th meeting? I believe Mr. Cimbura did state that the lungs were above average perhaps to some degree above normal with respect to the digoxin levels and then there was a discussion by Dr. Gilmour-Bryson and Sergeant Wolfe and Sergeant Press. Would those all have influenced your decision on the vote?

A. If you look at Mr. Cimbura's comments, and I should stress again that he is a very conservative, very cautious person, he advised that again as far as cause of death, the findings were inconclusive, although, one cannot throw out the possibility of overdose with these values. I think that this was probably the main reason that made me change.

Q. Doctor, that is one of the things I wanted to clarify with you was what you based your probabilities on. In your report on the children I believe you stated yesterday that that was based on a clinical diagnosis but in the September 13th



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meeting it was based on a number of other factors.

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So, that would be the clinical diagnosis as well

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as the toxicological data, as well as the number of

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cases within the study that were being discussed, as

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well as the timing of death in the persons that were

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on shift. Would those all be factors that would be

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part of the consideration in reaching your probability

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at the September 13th meeting?

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A. No, I don't think that the persons who were working had any effect on this type of a decision; the others, yes, I think so.

Q. So the timing of death and the number of cases being studied would be factors?

A. I'm not sure that the timing of death had much influence on the decision, not to me anyway.

Q. Well it just seemed to me, Doctor, that when you looked at the - I believe it was the Inwood case, where everyone changed their vote, from the first vote, that is page 5 of the Minutes.

A. Yes.

Q. And then on page 6 the vote was changed. Where the first comments after the first vote were those of Staff Sergeant Press who expressed the need to present a united front; then there was the further discussion about the levels and the situation.

A. That is true. The purpose of the meeting was really to try and arrive at the final decision which was a composite of the various aspects of the case with input from various people. It is like you have, in some ways, you could perhaps



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compare it to a jury, and if somebody was blocking it, like in my case, I had a different opinion, you have a hung jury, and you have a situation where things don't move, and there must be a little flexibility I think in a situation like this, you know too. I don't like to change my opinion very often, but I felt that in these cases it was warranted.

Q. Doctor, could you list what the factors were that went into making your decision at that meeting?

A. I think I already did but I will try to repeat them.

The clinical findings, the toxicological findings, were I believe the heaviest piece of evidence and accounted for almost everything. There may have been other factors, or things that I didn't know perhaps from a clinical standpoint when I entered the meeting that were told to me then and which probably influenced I think a little bit. I can assure you that any other factors such as who was there, what time it happened, things like this had no influence in that.

Q. Well, Doctor, if they were not meant to have an influence I don't understand why they were raised at the meeting, those factors



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in particular.

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It was my understanding that the purpose of this meeting was to assist the police in the investigation.

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A. Yes.

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Q. And also to assist them in terms of what to tell the parents, and that it was an ongoing part of the investigation and that the purpose ---

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MR. HUNT: I'm sorry, that is not the evidence as I recall it. The evidence has been very clear as to what the purpose of that meeting was.

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THE COMMISSIONER: I thought it was to advise the parents, I thought that was the main purpose of it.

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MS. JACKMAN: Q. Doctor, this was part of an ongoing investigation, was it not?

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Q. So what was your understanding of the purpose of that meeting?

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A. The purpose of that meeting was - of course I didn't call the meeting, but to



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my understanding it was to refine the cases as well as possible from the standpoint of whether or not the possibility of murder existed, and rule out the ones that could be ruled out, to permit the police then to speak to the parents and ease their minds, I think. I also believe that there was a great deal of publicity, so there were some public comments made then by - I have forgotten who, following this meeting, indicating which babies fell into which categories, and then the press became aware of this situation, that was I believe the purpose of the meeting.

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Q. Doctor, I want to turn to the Kevin Pacsai case now.

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A. I should say I was only a participant at the meeting, so maybe like the Crown Attorneys or the members of the Police Force, the Coroners can help you a little bit better for the exact reason that the meeting was called. I am sorry the next case?

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Q. Turning to Kevin Pacsai; you said the other day, and this is in Volume 76 at page 6700.

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A. Yes.

Q. And I will just paraphrase it;



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that basically Kevin Pacsai could have had a type of
arrhythmia that made him more resistant to digoxin.

In fact you stated:

"In fact, sometimes an atrial tachy-
cardia or atrial flutter fibrillation
are treated with high levels of
digoxin, high doses of digoxin because
these patients will require high levels
and they are very resistant to the
drug, that is well know."

A. Yes.

Q. So, Doctor, this is a clear
possibility in the case of Kevin Pacsai?

A. Yes, but I also stated further
that it may have been the opposite, that he may have
been more susceptible to it because of his brady-
arrhythmia.

Q. And you are not sure which
exactly?

A. No, there is no way of really
knowing.

Q. That was one of the questions
I had of you, Doctor. With respect to the other
children, how can you tell if they had atrial
tachycardia, or if it was ventricular tachycardia,



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2 is there any way of finding that out?

3 A. I don't think we have many
4 children who had arrhythmia preceding the terminal
5 episode. If you can tell me specifically I will try
6 and clarify it for you. Arrhythmias were usually
7 a problem during very terminal episodes only in most
8 children, and this can be any type of arrhythmia.
9 Usually the final event is the ventricular arrhythmia,
10 or a complete standstill of the heart, I am sure you
11 have heard many witnesses testify to this.

12 Q. Well, Doctor, I don't necessarily
13 need to know with respect to specific children,
14 but I wondered if you could help us in terms of
15 reading the chart, how we can tell, if the chart
16 will say, tachycardia, bradycardia, or ventricular
17 fibrillation, those are all types of arrhythmia.
18 Is there any way of telling if one of those is
19 atrial as opposed to ventricular, or is it you just
20 can't tell from a chart?

21 A. Yes, I think I can. You see
22 what we call atrial tachycardia, or supraventricular
23 tachycardia, or paroxysmal atrial or supraventricular
24 tachycardia is a very specific type of arrhythmia
25 and to my knowledge the only one in this entire
series who had it was Pacsai, I believe, I may be



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wrong, but I am pretty sure. So I think you can rule this arrhythmia out in all the others, because there is no evidence that they had it.

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THE COMMISSIONER: What do you call that specific type of arrhythmia, what do you call it, that Pacsai had?

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THE WITNESS: Atrial tachycardia; it has many names, atrial tachycardia, supraventricular tachycardia, and you can add the words paroxysmal in front of these names when you have paroxysmal atrial or paroxysmal supraventricular. You may, sometimes people add the word ectopic atrial tachycardia, so it has these different names, but it is the same thing really.

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MS. JACKMAN: Q. Doctor, is there any particular kind of congenital heart defect that would lead to that?

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A. Yes. In most cases the heart is normal, and I would say in about 80 per cent, or even more of the cases the heart is normal, but there are certain types of heart defects which are associated with this particular tachycardia, and these are Ebstein's anomaly, I'm not sure that there was anyone in this series who had it; E-b-s-t-e-i-n's.

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Then we have endocardial fibroelastosis,



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2 there were I think a couple of babies who had this
3 arrhythmia.

4 Q. I believe Taylor had that.

5 A. Endocardial cushion defect
6 such as commonality of canal, I believe Baby
7 Estrella had that. So-called inverted transposition
8 or corrected transposition which I don't believe
9 anybody here had.

10 Q. Is that inverted transposition
11 of the great arteries?

12 A. Yes. Now, the terminal
13 arrhythmias usually, as you heard from other
14 witnesses, a complete standstill or ventricular
15 fibrillation, that is the mechanism of death usually,
16 so it is a ventricular problem, or - well, eventually
17 it becomes a ventricular problem because the
18 ventricle either stops altogether or it contracts
19 in a very disorganization fashion.

20 Q. Now, Doctor, you mentioned
21 the other day as well that Dr. Doherty was a doctor
22 who you respected.

23 A. Yes.

24 Q. Who had developed an expertise
25 in digoxin.

A. Yes, his main work had to do



1
2 with radioactive digoxin.

3 Q. Doctor, we have an exhibit,
4 and it is Exhibit 17.

5 A. Yes.

6 Q. Which is an article by
7 Dr. Doherty.

8 A. Yes.

9 Q. Called: "How and When to Use
10 Digitalis Serum Levels".

11 A. Thank you.

12 Q. Now, Doctor, the third page
13 of that article, the last page is what I will want
14 to refer you to under: "Pitfalls in Interpretation",
and the second sentence in that article states:

15 "High serum levels of digoxin without
16 a toxic reaction are sometimes
17 observed with time inappropriate for
proper evaluation."

18 THE COMMISSIONER: What page are we
19 on?

20 MS. JACKMAN: I'm sorry,
21 Mr. Commissioner, it is the last page of the article
22 and it is under "Pitfalls in Interpretation".

23 THE COMMISSIONER: That is which,
24 Exhibit 17?
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MS. JACKMAN: Exhibit 17, that is what I have it listed as.

THE COMMISSIONER: Well the last page is the second page, the third page is a series of diagrams.

MS. JACKMAN: There are diagrams on the second page that I have and then the third page is written.

THE COMMISSIONER: You say it has got a heading?

MS. JACKMAN: Page 2596, it's at the bottom of that page ---

THE COMMISSIONER: Right, that is only the second page as far as I am concerned.

MS. JACKMAN: I have it as the third page.

THE COMMISSIONER: You obviously have been better favoured than I have; what is your second page, what does it look like?

MS. JACKMAN: My second page has graphs on it.

THE COMMISSIONER: Has grass on it?

MS. JACKMAN: Graphs.

THE COMMISSIONER: Oh graphs, yes, all right, yes, I will just transpose the two pages,



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and then I find "pitfalls in interpretation".

MS. JACKMAN: Q. Okay, Doctor, the part I am referring to, it is the second sentence under "Pitfalls in Interpretation".

THE COMMISSIONER: Yes, all right.

MS. JACKMAN: Q. "High serum levels of digoxin without a toxic reaction are sometimes observed with time inappropriate for proper evaluation of level in infants and children with atrial arrhythmia and in renal failure with hypokalemia."

Doctor, am I correct in reading from that that if a child has an atrial arrhythmia that it could lead to high levels in digoxin, in a serum digoxin reading?

A. This is a very strange sentence. I think both are true, the fact that children who receive high doses of digoxin may develop atrial arrhythmia. On the other hand children who have atrial arrhythmias may need high doses of digoxin to treat the arrhythmias, so these two situations are frequently found. Renal failure with hypokalemia we have discussed at length here I think.

Q. Now, Doctor, still in this



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article in the second column, the third last

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paragraph, there is a reference to potassium, the

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Doctor states:

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"However, a high serum potassium level affords some protection against digitalis intoxication and may give rise to a high digoxin serum level without clinical evidence of digitalis intoxication."

Doctor, am I correct in my understanding of that sentence that this doctor is saying that potassium may increase the digoxin serum reading in an infant?

A. Well, as I said yesterday, I believe it was or earlier, I find no evidence that potassium per se will increase the digoxin serum level. In reading this here, one would have the impression that that is what he is trying to say, but unfortunately, there are no references there and I just cannot -- you know, if that is what he is trying to say, I do not agree with him.

On the other hand, there are situations where a high potassium level and a high digoxin level very often come together. This is not unusual. Perhaps this is what he means, I am not sure, such as in renal failure, pre-renal failure, situations such as those. But evidence that potassium per se, a high potassium level will produce a high digoxin level does not exist, to my knowledge. I am not saying it



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is not impossible. It is just that I do not know about it.

Q. But, Doctor, it may be possible; is that right? And it may be that this doctor ---

A. I think it will be very unlikely that I have not heard about it for so many years.

Q. Well, Doctor, it seems to me that this doctor, Dr. Doherty, is stating it may give rise. He does not say it will, he said it may, and it may be based on his experience, we do not know.

A. He is a very competent clinician, but this is sort of a very vague statement and you cannot base a scientific opinion on a statement like this. You would have to look for references and then look up the proof for this statement.

Q. Well, Doctor, it is my understanding that this is a scientific opinion by Dr. Doherty in his article; is that not correct?

A. This is sort of a review article, and scientific opinions--if it is, it is not an original opinion. He is just reviewing his knowledge and he is not quoting. This is not the way really to produce scientific opinions. You should quote the sources usually.

I have great respect for him. Do not



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misunderstand me. He is very good.

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Q. Doctor, going to Gary Murphy, there was some discussion of him by you in Volume 77, and as well at page 6941, and as well in the Gary Murphy inquest, I believe.

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I do not believe it is necessary to take you through the evidence -- I will if you would like me to -- but it was my understanding that Dr. Kauffman and you had both -- or at least Dr. Kauffman's theory, which you were not too sure about, was that in the process of dying, serum levels could increase and that in this particular case, that of Gary Murphy, that may be what had happened to the serum levels, or there may have been an increase or an elevation of his serum levels while he was dying.

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THE COMMISSIONER: This was because of the release -- the death of certain tissues and the release of digoxin from them?

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MS. JACKMAN: That is correct.

THE COMMISSIONER: And Dr. Hastreiter's expression or opinion is that it was not that, that it was pre-renal failure, is that not so?

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THE WITNESS: That is correct. I had difficulty agreeing with that opinion simply because -- I think it is a very good hypothesis. First of all,



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it is difficult to prove and secondly, almost every child that dies has resuscitation procedures performed on the child, plus very often defibrillation, electrical shocks and things like this. So this is a pretty routine situation. So why do not all the other children have high levels? I do not find this to be a very good explanation for this.

MS. JACKMAN: Q. Well, Doctor, in these cases we do not really have any levels taken at the process of dying except for Justin Cook, and he did have a high level ---

THE COMMISSIONER: No, we have all the additional children who have died since then, every one of them.

THE WITNESS: Post mortem bloods?

THE COMMISSIONER: Yes, post mortem in all of the children who died at The Sick Children's Hospital since 1981.

MS. JACKMAN: No, I meant the ante mortem serum levels taken during resuscitation. It is my understanding that the only real case we have of that is Justin Cook.

MS. CRONK: Well, sir, to assist on that, you will recall that Exhibit 232 is the computer printout supplied by Dr. Phillips. There are a number



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of cases; there are certainly not all of them, but
there are a number where they were taken during
resuscitation.

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THE COMMISSIONER: Well, I know, but
I think now Miss Jackman is now talking about ante
mortem blood.

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MS. JACKMAN: I am talking ante mortem
levels.

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THE COMMISSIONER: What follows from
that?

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MS. CRONK: So am I, sir, in the
sense that if you treat a sample taken prior to the
actual pronouncement of death as being an ante mortem
specimen, there are a number.

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THE COMMISSIONER: Some of them are
some days before.

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MS. CRONK: Most of them are some
days before.

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MS. JACKMAN: But not during
resuscitation.

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THE COMMISSIONER: What is your
question?

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MS. JACKMAN: Well, my question was
whether the doctor agreed that that was possible.

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THE COMMISSIONER: What was possible?



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MS. JACKMAN: Q. That there could be a tissue release of digoxin in the course of resuscitation?

A. I would agree that there is tissue release and there is redistribution, but there is no clear evidence that this would raise the levels in the blood.

Q. Well, you may not know the extent of it. It would depend, I expect, on how much digoxin had distributed into the tissues; would that not be correct?

A. Could you say that again?

Q. Would it not depend on how much digoxin had actually distributed into the tissues --

A. No.

Q. -- to be released from them?

A. No, it is a very complicated procedure because it will be released from the higher concentration tissues, goes into the blood; it may go from blood into lower concentration tissue. There is completely different equilibrium after death, but the upshot is that the blood level is not very high. I mean, it can be, as we have heard from the multiplier factor, it can be two times higher, perhaps even three times higher than the pre mortem blood,



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and this is exactly the reason for it. It is the release of digoxin and the breakdown of tissue that occurs after death, but not to a level of this magnitude.

Q. Well, Doctor, I was not giving you the magnitude. I was just asking if it was possible?

A. I can answer you saying that it is possible, but it will not produce increases of digoxin levels of this magnitude. So the magnitude has to be incorporated into the answer.

Q. Now, Doctor, again with Gary Murphy, I believe that your theory was that there might possibly have been transient pre-renal failure?

A. Yes.

Q. And my understanding of that is that basically the heart is unable to profuse enough blood to allow the kidneys to excrete digoxin?

A. Right.

Q. Doctor, was there any evidence of this on autopsy?

A. You cannot see it on autopsy. You could only really document it by laboratory data which would have been taken shortly before the baby's



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death and which may have proven this. Unfortunately,
we do not have this proof; this proof is not there.

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I think the last laboratory data
obtained was one day before the baby's death, and it
does not show it -- one or two days, I am not sure.
So I cannot prove my hypothesis either, but I think
my hypothesis is a little more plausible because it
it is a common phenomena. We see this quite
frequently.

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Q. Had Gary Murphy had pre-renal
failure for a period of time, would that have likely
have showed up on autopsy? Would there be any effects
that you know of, say, to the kidney?

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A. Well, it would show up indirectly.
For instance, if that child had severe heart failure,
which is the reason for pre-renal failure, one of the
main reasons, I mean, the autopsy showed that his
heart was very bad, so it would help in that regard,
but it is very indirect evidence.

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There is no lesion of the kidney
itself because pre-renal indicates that the kidney
itself is not damaged. If there was renal failure,
then you would see actual damage of the kidney.

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Q. Then, Doctor, the other day
you were talking about the kinds of conditions that



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could lead to sudden death, and this is in Volume 77 at page 6816.

Doctor, I wanted to see from you if you could put any of the children into any of those categories of defects that could lead to sudden death. I think the easiest way of doing that would be to look at the Atlanta Report on the diagnosis, which is Appendix 3. That has just a short term indentification of the kinds of defects that the children had. With the first of the defects that you mention, I have gone through this ---

THE COMMISSIONER: Am I the only person with page numbers on the Atlanta Report? Have you page numbers?

MS. JACKMAN: Pardon?

THE COMMISSIONER: Have you page numbers?

MS. JACKMAN: No, Mr. Commissioner, I do not. It is near the end.

THE COMMISSIONER: Well, how far from the end?

MS. JACKMAN: It is in the appendix. It is about 10 to 12 pages from the end.

THE WITNESS: I do not have a copy of the Atlanta Report here with me.



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MS. JACKMAN: It is 12 pages from the end.

THE COMMISSIONER: Appendix 3, is it?

MS. JACKMAN: Yes, it is Appendix 3. It is just after the descriptions of the children.

THE COMMISSIONER: Would you put a nice big 63 on the right-hand top corner of that.

MS. JACKMAN: Page 63.

THE COMMISSIONER: Then we can work on it from there.

MR. HUNT: It is Exhibit 270.

THE COMMISSIONER: Exhibit 270, is it? All right. Now, what do you want him to do now, please?

MS. JACKMAN: Q Well, Doctor, I have gone through it and I wanted to ask your -- except I am not quite sure that I was clear enough on your categories to be able to put the children into them, but what I want to do is go through the categories with you of the kinds of defects that can lead to sudden death and tell you which children I found that had those kinds of conditions to see if you would agree that they could be put in that category.

MR. HUNT: The doctor does not have the exhibit yet, I do not think, do you? It is Exhibit 270.



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THE COMMISSIONER: Well, I wish I was sure what this exercise was going to -- I do not know what is happening here. You want to take each one of these children and see whether they -- well, he has already done that. He has given his views with respect to the children as to whether they ---

MS. JACKMAN: No, Mr. Commissioner, I do not want to go through each of the children. I looked through the identification of their defects and his categories, and I just wanted to ask him if the children that I have that seemed to me to fit within each of those categories he would agree fits within the categories.

THE COMMISSIONER: I am sorry, each of which categories, of each of the 14 categories?

MS. JACKMAN: The categories that he identified on page 6816 in Volume 77 as being the kinds of illnesses or defects that would lead to sudden death.

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A. Well, maybe I should explain this again. What I was referring to really doesn't apply well to this group of babies, and I tell you why, because I was referring to lesions in which the baby is doing well, appears to be healthy and then suddenly dies. Now, in this series here that we are dealing with, practically every baby was very sick with the exception of two or three maybe, and there is no application, even remotely, of what I just said, any lesion can produce sudden death in a baby who is very sick, any lesion, any severe lesion. So, I don't really see the purpose of this.

Q. Well, actually, Doctor, you have clarified it for me. Basically sick children could have sudden death regardless of the defect, with these kinds of defects that these children had.

A. Almost every one, yes.

Q. All right, Doctor. We have received a number of articles about substance X. Are you aware of sort of the studies or the theories that are being proposed now with respect to the creation of a digoxin-like substance by children under two months of age?

A. Yes, I am aware of it. I wouldn't



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3 call it creation, I think the substance exists. There
4 is a great search going on for the substance and some
5 investigators have already felt that they have
6 identified the substance and which appears to be a
7 progesterone derivative, progesterone being a hormone
8 that occurs in ladies but whether the same substance
9 occurs, because in newborns is where the substance
10 has reached the high levels, except in patients
11 with renal failure, and whether this substance is
12 the same as has been identified in others, adults,
13 is not known.

14 Also, some people have tried to relate
15 this substance to what is called the natriuretic
16 hormone, a hormone which regulates the excretion of
17 sodium from the body and the blood pressure.

18 So, it may be a very involved situa-
19 tion.

20 Q. Well, Doctor, my only reason
21 for raising it is that in light of this information
22 that is still at a nascent stage of investigation,
23 would it be fair to say that it could now or in the
24 future have an effect on some of the interpretations
25 of the toxicological data on these children?

A. No, not at all. The highest
values of this substance that have been reported



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2 have been in the order of 2 to 4 nanograms per ml
3 and we are talking here with toxicological data
4 that we have of levels in the range of above
5 30 to 100 or in Inwood's case, 491. So, a difference
6 of 2 nanograms in 30 or 50 or 70 or 100 or 400 is
7 very minimal, isn't it?

8 Q. Well, Doctor, I had understood
9 that in a number of these cases that you couldn't
10 place any certainty on the levels anyway because
11 they were fixed or exhumed.

12 A. Well, now we are going back
13 to tissue levels. Now, the substance X has been
14 determined in blood. I have no knowledge that it has
15 been studied in tissues.

16 Q. But that is a possibility,
17 is it not, if it is in blood?

18 A. I think it would be rather
19 remote except perhaps in the tissue that produces
20 it. For instance, if it turns out to be progesterone
21 then it would be found in the ovary maybe and in the
22 adrenal glands, but I don't see how it should be
23 found -- perhaps in the liver because the liver
24 degrades it, breaks it down, but I don't see why
25 it should be found in the heart or the skeletal
muscle or any other tissues.



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Q. But you don't really know, do you, Doctor?

A. I don't think anybody knows because this is a fairly new development. I am sure it would not interfere with -- well, I cannot say I am sure it would not interfere, I can say this. As you very well know, in some of these cases the substance, the digoxin has been actually identified not only by the usual RIA method, but also by other more specific methods such as HPLC and mass spectrometry and this of course will be true. I think the error there would not exist. So, it has been proven in some cases, not in every case, that at least a great proportion of what we call digoxin-like substances is through digoxin.

Now, we also know that digoxin is metabolized, it is degraded into certain sub-products and some of these products can easily be identified also. I don't think we looked specifically for them, but I am sure that they are responsible for the remaining portion. I think to invoke substance X as contributing to this will be a very far-fetched -- nobody has ever done this.

A. No, I understand this, Doctor, and it may not be likely that it would have any effect



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2 but my only point is that at this point you can't
3 say with any certainty, with any real certainty,
4 whether or not substance X could have been in some
5 of those levels.

6 A. I could say that if it were
7 at all, which is a very, very remote possibility,
8 it would comprise a very small proportion of the
9 total.

10 Q. Based on what you know of it,
11 now?

12 A. Right.

13 Q. Right.

14 A. Based on what I think the
15 general knowledge of it is now.

16 Q. Then, Doctor, the final thing
17 that I want to cover with you has to do with your
18 ratings and that of the Atlanta Report. It is
19 Appendix -- it doesn't even have an appendix
20 number, Mr. Commissioner, it is the ratings by
21 the consultant cardiologist.

22 THE COMMISSIONER: I thought the only
23 place we could find those was under each child.

24 MS. JACKMAN: It is past the
25 diagnosis, about five pages past.

THE COMMISSIONER: Past the diagnosis,



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that is after appendix 3, is it?

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MS. JACKMAN: Yes, it is about five
pages beyond -- four pages beyond.

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THE COMMISSIONER: Ratings by
Consultant, that is page 68, if you put a 68 on
the top corner.

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THE WITNESS: I don't have a copy
of that.

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THE COMMISSIONER: Do I have the only
one?

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MS. JACKMAN: Q. Now, Doctor, actually
I am not sure you need to go through it, I will tell
you because I have gone through it, there is a
number of children that have been rated as poor in
the Atlanta Report prognosis and that includes
Perreault, whose prognosis is poor. I am going to
compare them with your ratings, okay, because I want
to draw your attention to one case in particular.

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THE COMMISSIONER: Yes, all right.

19

MS. JACKMAN: Now, in the Perreault
case the Atlanta Report rating ---

20

21

THE COMMISSIONER: Which is Perreault,
what number?

22

MS. JACKMAN: Perreault is 02001.

23

THE COMMISSIONER: 02001, I don't see it.

24

25



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MS. JACKMAN: The Atlanta Report
rating is poor.

4

A. I don't see that.

5

THE COMMISSIONER: I don't see an
02001, I don't see it here.

6

7

MS. JACKMAN: Oh, Mr. Commissioner, there
is the first page of that graph which was inserted
later on on that chart. I have it in my copy.

9

10

THE COMMISSIONER: 02001 is at page 66,
that's right. You say that is Perreault?

11

MS. JACKMAN: 02001.

12

THE COMMISSIONER: All right, that is
Perreault?

13

14

MS. JACKMAN: That is Perreault.

15

THE COMMISSIONER: That's not where
you find the prognosis.

16

17

MS. JACKMAN: And the prognosis is
poor.

18

19

THE COMMISSIONER: Well, I'm sorry,
I haven't got that, something has happened to it.
Oh, I see, it is on page 69, it is on the next
page.

20

21

22

MS. JACKMAN: It was missed out of
our copy and we were given that page later on to
insert.

23

24

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THE COMMISSIONER: Well, again, I guess
I wasn't on the mailing list at any rate.

4

MS. JACKMAN: Perhaps I should just
read it and tell you what it says.

5

6

THE COMMISSIONER: Well, just let's do
one at a time because there is no point in reading
them all.

7

8

MS. JACKMAN: I'm not going to read
all the children.

9

10

THE COMMISSIONER: Now, 02001 you say
is the prognosis. What is Dr. Hastreiter's
prognosis?

11

12

13

MS. JACKMAN: Dr. Hastreiter's severity
rating was 10.

14

15

THE COMMISSIONER: Well, that certainly
sounds pretty poor to me.

16

17

MS. JACKMAN: Yes.

18

THE WITNESS: As poor as it can be.

19

MS. JACKMAN: It does. And his
digoxin possibility was small.

20

THE COMMISSIONER: Yes.

21

MS. JACKMAN: And at the September 13th
meeting you categorized this death as natural.

22

THE COMMISSIONER: Yes.

23

MS. JACKMAN: Now, the reason I am going

24

25



1
2 through these cases, Doctor, is because I have a
3 concern about times.

4 THE COMMISSIONER: Well, then, could
5 we ---

6 MS. JACKMAN: Compared to the rest
7 of them. So, I want to just explain to you what the
8 ratings were on six cases, okay?

9 THE COMMISSIONER: Can't we get to
10 Hines now, is there any possibility?

11 MR. TOBIAS: I would love to be able
12 to accommodate you.

13 THE COMMISSIONER: Yes.

14 Well, can we not get to Hines now?

15 MS. JACKMAN: Well, yes, I can get you
16 to Hines.

17 THE COMMISSIONER: Well, if the others
18 are all the same.

19 MS. JACKMAN: Well, the point is,
20 Doctor, with Perreault, Murphy, Heyworth,
21 Volk and Floryn, their prognoses were all poor in
22 the Atlanta Report rating. Their ratings by you in
23 terms of severity were 8, 9 or 10. Your
24 digoxin possibilities were small to fair and at
25 the September 13th meeting you categorized their
deaths as natural for all of them.



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2

Then, Doctor, we come to Hines.

3

THE COMMISSIONER: Yes, all right.

4

MS. JACKMAN: Which is 02057.

5

THE COMMISSIONER: Yes.

6

MS. JACKMAN: The prognosis is guarded.

7

Your severity rating is 3, your digoxin possibility

8

is good and you have categorized him at the

9

September 13th meeting as probable murder.

10

Now, the reason I raise this, Doctor,

11

is because with all the other guarded children your

12

ratings are 5 or over, the children with guarded

13

prognoses, your severity rating is 5 or over and

14

it seems to me that Hines sticks out sort of like

15

a sore thumb when you compare your categorization

16

of probable murder and the digoxin possibility of

17

good with the Atlanta report ratings. All of the

18

other prognoses that I compared with guarded or

19

poor were children with high ratings, they more or

20

less compared with what the Atlanta Report experts

21

had categorized except for Hines.

22

I wanted to know, Doctor, if there

23

was any reason why Hines would be so much off

24

from the other experts when all of your other rat-

25

ings seemed to compare with the Atlanta Report

experts?



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THE COMMISSIONER: What do you mean, off? The differences between guarded and 3, is that what you are talking about?

MS. JACKMAN: Yes.

THE COMMISSIONER: Well, it's not that much off, is it?

MR. YOUNG: Mr. Commissioner, I am sorry to interrupt my friend, but with respect, I don't know how the doctor is going to be able to comment upon how Atlanta came to their decision unless he has read what the people from Atlanta have said.

MS. JACKMAN: Well, Doctor, we can look at Hines. There is a short paragraph in Appendix 2 which is 02057 and it states that the consultant cardiologist scored the timing of death as expected and consistent with clinical status and the mode of death as inconsistent with digoxin intoxication; the pharmacologist scored the death as 3 on the 1 to 5 scale and was unable to say whether or not the digoxin in the tissues was present in toxic quantities or estimated time of digoxin administration.

I believe that the pathologist found the changes in tissues and the persistence of



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(Jackman)

7638

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brown fat to be consistent with the diagnosis of
Sudden Infant Death Syndrome. However, he emphasized
that that is a disease without specific autopsy
characteristics.

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THE COMMISSIONER: What is, could I just once again ask, what is the question? Is the question, why do you differ from the Atlanta Report on the ---

MS. JACKMAN: Mr. Commissioner, it was so far off from all the rest of the ratings where the doctor and the experts in the Atlanta Report had more or less coincided in their severity ratings and their digoxin possibilities.

THE COMMISSIONER: Guarded in 3, is the difference, is that right?

MS. JACKMAN: Yes.

THE COMMISSIONER: Guarded in 3 is the difference, is that right, guarded in 3 is not so far off.

MS. JACKMAN: Well, Mr. Commissioner, all of the other guardeds Dr. Hastreiter has given the minimum that he has given is a 5 except for Jordan Hines.

THE COMMISSIONER: Yes, all right.

MS. JACKMAN: So it is the lowest rating that he has given to anyone where the Atlanta Report has given a ---

THE COMMISSIONER: Apparently your .2 or 2/10ths on that one according to some



EE2

1
2 others, do you want to make any comments?

3 THE WITNESS: I will be happy to.
4 I think this was already brought up earlier during
5 my evidence here, and I don't quite understand what
6 Dr. Nadas' reasoning is for classifying Jordan Hines
7 in the more severe category. This summary here on
8 page 58 does not exactly explain his reasoning.
9 Therefore, I really cannot say why he did that. I
10 can only tell you why I did what I did.

11 MS. JACKMAN: Q. Doctor, would
12 it be fair to say that you put less on the possibility
13 of Sudden Infant Death based on your clinical
14 assessment than did the others, than did Dr. Nadas,
15 or the consultant pathologist.

16 MR. YOUNG: It is my understanding,
17 Mr. Commissioner, that we are going to have the
18 privilege of asking Dr. Nadas this.

19 THE COMMISSIONER: Well, it is
20 news to me, I thought we were not.

21 MR. YOUNG: Is that right, well then
22 my understanding is incorrect.

23 THE COMMISSIONER: I'm not even
24 on the mailing list, I'm not even on the speaking
25 list apparently.

MR. YOUNG: It appears I am wrong.



1
2
3 It appears I have my
4 wires crossed. The point of the matter is that
5 is not going to allow this witness to have any more
6 information on what Dr. Nadas was thinking.

7 THE COMMISSIONER: Isn't this -
8 well certainly, by all means put it to him; you
9 realize this is contrary to what Dr. Nadas said
10 according to the Atlanta Report, what can you do
11 about it and let him say that, but isn't this for
12 argument? Dr. Nadas has said that it is at this
13 level, and Dr. Hastreiter puts it at a slightly
14 different level, I don't think there is though:
15 "The consulting cardiologist...", I am now looking
16 at page 59 of the Atlanta Report, is your's numbered?

17 THE WITNESS: Yes.

18 THE COMMISSIONER: At the very top:
19 "The consulting cardiologist..."
20 02057 is Hines?

21 MS. JACKMAN: Yes.

22 THE COMMISSIONER: "The consulting
23 cardiologist scored the timing of
24 death as expected and consistent with
25 clinical status and the mode of death
is consistent with digoxin intoxication."



EE4

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Which is somewhat contrary to what
your view on it.

3

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THE WITNESS: Yes, but it doesn't
say why he did.

5

6

THE COMMISSIONER: No, it doesn't
say why he did it.

7

8

THE WITNESS: And there are several
possibilities, maybe Dr. Nadas was impressed with
the Sudden Infant Death Syndrome; and he could have
been impressed with the theory of sepsis, he could
have been impressed with the baby's arrhythmias.
There are several possibilities and I really don't
know what his reason was.

10

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MS. JACKMAN: Well, Mr. Commissioner,
I will leave it at that. Those are my questions.

15

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THE COMMISSIONER: Yes, all right,
thank you. We will recess now. Mr. Tobias, have
you any other thoughts as to how long you will be?

17

18

19

MR. TOBIAS: Well I am a little
nervous, Mr. Commissioner, I have been told by
six or seven of these lawyers if I go over 10 minutes
they will beat me up, being the last to cross-examine.

20

21

22

THE COMMISSIONER: I don't like to
encourage violence.

23

24

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MR. TOBIAS: I would think I could



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probably do it in half an hour.

3

THE COMMISSIONER: Mr. Hunt, does

4

that leave you and Miss Cronk enough time?

5

MR. HUNT: I won't be very long,

6

about 10 minutes at the most.

7

THE COMMISSIONER: Well, I think --

8

what time do you have to leave to catch your plane?

9

THE WITNESS: My plane doesn't

10

leave until 8 o'clock.

11

THE COMMISSIONER: Don't say that.

12

All right, we will take 15 minutes.

13

---Short recess.

---Upon resuming.

14

THE COMMISSIONER: Yes, Mr. Tobias.

15

MR. TOBIAS: Mr. Commissioner, I

16

am the last counsel to cross-examine and I know it

17

has been several long days and we are close to the

18

end of the day, but please be gentle with me, I am
very sensitive.

19

THE COMMISSIONER: I will be

20

gentle with you, particularly as you have promised

21

me that others won't. I think I should announce

22

though that clearly we're not going to be able to

23

get to the argument tonight, but we will have it

24

tomorrow morning at 10 o'clock on the stated case

25

EE5



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2 that many are asking for. So I will just simply
3 receive argument from those who are here, and if
4 nobody is here there won't be that much argument.

5 MR. TOBIAS: Is that an invitation
6 to be absent, sir?

7 THE COMMISSIONER: Well, no, but if
8 you are absent I won't hold it against you, that's
9 all I say.

10 CROSS-EXAMINATION BY MR. TOBIAS:

11 Q. Dr. Hastreiter, my name is
12 Warren Tobias and I act for the parents of Jordan
13 Hines.

14 Several times during the course of
15 these proceedings we have heard references made by
16 various witnesses, Dr. Kauffman in particular, to
17 Sudden Infant Death Syndrome being a disease without
18 specific pathology. Dr. deSa is paraphrased in the
19 Atlanta Report as saying it is a disease without
20 specific autopsy findings.

21 Now in giving his evidence before
22 this Commission, Dr. Kauffman was asked to expand
23 upon that phrase for us and to advise us what he
24 meant by it; and his evidence was that there are
25 certain markers that may be present at autopsy
which may be suggestive of Sudden Infant Death



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2 Syndrome if all other factors are excluded, but
3 they are not necessarily definitive of Sudden
4 Infant Death Syndrome because you can see some of
5 these findings in many other children.

6 I would like to start by asking you
7 whether or not you would agree with that observation?

8 A. Yes, that is my understanding.

9 Q. Now, the evidence to date has
10 disclosed that there were several specific conditions
11 found in Baby Hines on autopsy which lead Dr. Becker,
12 the pathologist, to reach a diagnosis of Sudden
13 Infant Death Syndrome, or missed-Sudden Infant
14 Death Syndrome. I would like to ask you particularly
15 about brain stem gliosis, I understand that is
scarring of the brain stem, am I correct?

16 A. That is right.

17 Q. Is this a condition that you
18 would say is specific to Sudden Infant Death
19 Syndrome, or can it be seen in other children as
well?

20 A. As you know I am not a
21 pathologist, and I am not sure about my qualifications
22 to answer your question.

23 From my reading I know that Dr. Becker
24 himself, his group here has shown that such lesions
25



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3 can be found in children with other problems such as
4 heart disease, cyanotic heart disease, and I think
5 babies with respiratory distress syndrome, higher
6 membrane syndrome. I am not sure about the sources
7 of these references but I know that it can occur in
8 other situations.

9
10 Q. Is it your understanding from
11 your reading of the literature that this is a
12 condition that can be seen in cases where we have
13 a baby that is hypoxemic or very cyanotic?

14 A. Exactly. This is an indication
15 of chronic hypoxia, hypoxemia and cyanosis being one
16 of the groups in which this occurs, cyanotic heart
17 disease.

18 Q. Now I understand that another
19 finding in Baby Hines was one of extramedullary
20 hematopoiesis. Do I understand that that is the
21 manufacture of blood cells in certain parts of the
22 body where one would not usually expect to find the
23 manufacture of blood cells?

24 A. That is correct.

25 Q. It is my understanding that
this can occur in infants who are not necessarily
SIDS candidates, particularly in newborns and neonates;
am I correct in that, sir?



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3 A. Yes. It is also an indication
4 of hypoxia or hypoxemia and apparently it is
5 mediated through a hormone produced by the kidney
6 which is called erythropoietic which stimulates
7 these organs to produce red blood cells, and these
8 organs would be the liver, the spleen and the thymus
9 I think mostly.

10 Q. That would be the site that
11 you would normally expect to find the manufacture
12 arising from this condition, is that correct?

13 A. The normal manufacturing of
14 red blood cells after a few weeks of life is
15 restricted to the bone marrow.

16 Q. No, what I am saying is would
17 you see an indication of extramedullary hematopoiesis
18 you would see the manufacture of those cells in the
19 liver, spleen and thymus, that is where you would
20 find it?

21 A. Right.

22 Q. And that is in fact according
23 to the pathology report on Hines where you did find
24 it?

25 A. Right.

Q. Now we have also heard numerous
references throughout these proceedings in



1
2 association and in conjunction with Baby Hines to
3 the question of the arrhythmias; and numerous
4 articles have been presented to the Commissioner
5 on the subject. In particular there was an article
6 and this is Exhibit 161, Mr. Commissioner, by Kelly
7 and Shannon, and I don't think I am being unfair
8 if I paraphrase, Doctor, as saying that that
9 article basically indicated that arrhythmias was
10 something that was fairly rare in cases of Sudden
11 Infant Death Syndrome, and which was marked,
12 according to the authors' research by the presence
13 of prolonged QT interval. However, they reported
14 there were only three reported cases of prolonged
15 QT interval found in association with Sudden Infant
16 Death Syndrome. Have you read that article, Doctor?

16 A. Yes.

17 Q. And is your understanding the
18 same as mine, have I correctly paraphrased it?

18 A. Yes.

19 Q. There has also been an exhibit
20 produced which was an article which appeared in the
21 British Medical Journal of April 1983 by Dr. Southall,
22 and that was marked, Mr. Commissioner, Exhibit 180.
23 I ask you, Doctor, whether you have had an opportunity
24 to read that article?
25



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A. Yes.

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Q. If you will recall that article attempted, or the study rather upon which the article was reported attempted to monitor a controlled group of children some of whom subsequently went on to die from Sudden Infant Death Syndrome. Am I correct that one of the findings in that article was that of 29 cases where they had monitored a child on a cardiac monitor and the child had subsequently died from SIDS, in only one of them did they find any presence of arrhythmias prior to the terminal events?

13

A. That is correct.

14

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Q. Now those very points, the points made in the Kelly and Shannon article, and the major point of the British Medical Journal article, are those indicative of one of the concerns that you have in this particular case with the SIDS diagnosis?

19

A. Right.

20

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Q. Can you help me, Doctor, I understand that you have indicated that - and this was in the evidence that you gave my friend Mr. Lamek I believe the second day of your testimony, that a history of arrhythmias is not inconsistent with



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3 SIDS; and in the Hines case it is not only that
4 history of arrhythmias but the particular type of
5 arrhythmias that bothered you; do you recall giving
6 that evidence?

7 A. Yes.

8 Q. I wonder if you might help me,
9 what type of arrhythmias is it that you are referring
10 to, what type of arrhythmias did you see in the
11 Hines case that you think are inconsistent with the
12 SIDS diagnosis?

13 A. Baby Hines had essentially
14 two types of arrhythmias, bradyarrhythmia as well
15 as tachyarrhythmia, or bradycardia and tachycardia.
16 While bradyarrhythmias, and especially sinus brady-
17 cardia has been frequently reported in SIDS, children
18 with SIDS, and usually following the apnea episode,
19 the tachyarrhythmias do not. Tachyarrhythmia would
20 be very, very difficult to explain, in my opinion.
21 Maybe some time if I could elaborate on this, but
22 maybe I should answer your questions first and then
23 get back to this.

24 Q. All right. Let me ask you
25 this. You say that bradycardia is something that
can commonly be seen after a period of apnea. Can
you tell us why, can you explain the mechanics to



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us as to why a period of apnea will produce a brady-
arrhythmia?

3

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A. Yes. Any situation where

5

hypoxia occurs, hypoxia affecting the central nervous
system will

6

/produce a vagal reflect situation where bradycardia

7

occurs, it is a situation related to hypoxia.

8

Q. Now, I am showing you, Doctor,

9

an exhibit that was made Exhibit 103B, which is the

10

Zebra package with respect to the infant Jordan Hines.

11

I wonder if you could have a look particularly at

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the rhythm strips that are part of that Zebra pack?

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FF
BN/PS

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2 Can you indicate to me from looking
3 at those rhythm strips whether or not in the
4 case of Baby Hines there is evidence of a kind
5 of tachycardia that you feel is not commonly
6 associated with Sudden Infant Death Syndrome?

7 A. Well, there are two tracings
8 here, electrocardiograms. The first one is not dated.
9 I am not sure what the date would be on this tracing
10 here. The second one, I believe, is dated the
11 6th of March, which is two days prior to the baby's
12 death. So if I could start with the second one, it
13 shows what appears to be regular sinus tachycardia,
14 nothing terribly unusual about that. The rate here --
15 let me just see, let me tell you more exactly here
16 if I can turn this on -- is about 180.
17 Now, the tracing on top, which is not dated, though,
18 is quite unusual.

19 Now, I have to make clear that if
20 this is a terminal tracing, then what I am saying
21 does not apply. But if this is a tracing obtained
22 earlier, it is strange because we have a segment
23 of tachycardia and a segment of bradycardia where
24 the rate is very slow. In both of these, it appears
25 to me that it is not a sinus rhythm, not sinus
tachycardia or sinus bradycardia, but that it is a



1
2 rhythm occurring outside the sinus node, that is,
3 it is not produced by the regular pacemaker of
4 the heart. It is what one would call and ectopic
5 atrial rhythm producing tachycardia and bradycardia.

6 So this is a real arrhythmia, and
7 not just acceleration of the sinus node or
8 slowing of the sinus node produced by hypoxia.
9 It indicates that there is very likely something
10 wrong there with the conduction system of this
11 baby.

12 Q. All right, and does that
13 observation or do those observations noted on the
14 rhythm strips make you even less confident in the
15 Sudden Infant Death Syndrome diagnosis?

16 A. Yes. Perhaps I should explain
17 why briefly.

18 Q. I was about to ask you that,
19 Doctor.

20 A. My concept with Sudden
21 Infant Death Syndrome is one in which babies
22 die unexpectedly and there is no obvious cause of
23 death.

24 Now, if a baby just dies unexpectedly,
25 this can be produced by several reasons. For instance,
a baby can develop an acute infection, pneumonia,



1
2 meningitis, culminating meningitis and can die very
3 rapidly and very suddenly. But there is a definite
4 cause and you do not call that Sudden Infant Death
5 Syndrome. Or if a baby dies in an accident, you
6 would not call that Sudden Infant Death Syndrome,
7 or if a baby has an arrhythmia, in my opinion, the
8 same should apply.

9 In other words, if you have a known
10 cause for the baby's demise, even though it is
11 abrupt and sudden, I do not think that one should
12 classify a baby into that group.

13 Now, I reviewed the literature on
14 arrhythmias, tried to review it as well as I could,
15 on Sudden Infant Death Syndrome, and the evidence for
16 arrhythmias is really very, very scant. There are
17 occasional children who have what is called a
18 prolonged QT interval and prolonged QT interval
19 makes these children susceptible to sudden death
20 because the theory being that they develop a
21 premature beat that hits the vulnerable period
22 when the ventricle is very sensitive and produces
23 a chaotic rhythm, ventricular fibrillation and
24 children die very suddenly. So there are a few
25 cases, very rare instances of that.

Then there are one or two instances



1
2 of so-called pre-excitation syndrome, when they have
3 an anomalous connection between the atrium and
4 ventricle, and the impulses go down and then come
5 up again, make a circular type motion, producing
6 a tachycardia. Then there is this one case
7 in that British article ---

8 Q. Right, you are referring to
9 the British Medical Journal of Medicine article,
10 yes.

11 A. Right, where the child had
12 multiple premature ventricular contractions, and
13 essentially this is all I found. I find many
14 references indicating that the arrhythmias are quite
15 unusual in this situation.

16 So in my opinion, if the child has
17 clearly established arrhythmia such as these that
18 I just mentioned, he should not be labeled a
19 Sudden Infant Death Syndrome, and Baby Hines,
20 of course the findings, the clinical findings and
21 history are quite suggestive of some defect of the
22 conduction system, very likely a so-called
23 sick sinus syndrome, and he suddenly has an
24 arrhythmia here, it is documented. I do not believe
25 that we should label him as a Sudden Infant Death.

THE COMMISSIONER: Could he not have an



1
2 arrhythmia as is indicative of a sick sinus syndrome
3 and also die of SIDS as well, I mean, he could
4 have it and not die of it?

5 THE WITNESS: Yes, this is possible
6 but to my knowledge, again, there have been no such
7 cases in the literature. It would be a coincidence
8 because both are rare. I mean, the Sudden Infant
9 Death Syndrome is not that rare. It occurs perhaps
10 in two to three out of 1,000 babies, but the sick
11 sinus syndrome is rare. If you put the two together,
12 I think the probability that the two would occur
together would be very rare.

13 MR. TOBIAS: Q. Now, Doctor, just
14 so that I understand you, you said that when you
15 were reviewing the literature there was the one
16 case you found in the British Medical Journal
17 article of multiple ventricular premature beat.
18 That was a case of one infant out of the 29 who died
of SIDS?

19 A. Right.

20 Q. And that was the only case
21 out of the 29 in which they did see any case of
arrhythmia?

22 A. That is correct.

23 Q. Now, notwithstanding what you have
24
25



1
2 just told us, you recall that Mr. Scott asked you the
3 other day to look at an article which was marked
4 as Exhibit 284, which was the article appearing
5 in the November 29th, 1983 issue of the Medical
6 Post, the American Heart Association article
7 reporting on the work of Doctors Marino and
8 Bharati. Now, since Mr. Scott first put that
9 article to you the other day, have you had an op-
portunity to read it in full and to consider it?

10 A. Yes, I have.

11 Q. Now, particularly with respect
12 to the last four or five paragraphs of that article,
13 and I am not going to put them to you or read them to
14 you, but would I be fair in saying that at the
15 present time what the significance of the article
16 is is that the doctors have found a working hypothesis
17 which deserves further study and further investiga-
tion which they wish to look at more closely?

18 A. That is correct. This is
19 actually an old hypothesis for SIDS. It is not a
20 new hypothesis. In fact, it was first established,
21 I believe, by Dr. Tom James, J-a-m-e-s, a long time
22 ago, in the '60's, 1960's. People have been trying
23 to find a reason, of course, for SIDS, but this
24 hypothesis, more or less, to some degree competes with the
25



1
2 apnea hypothesis because most people nowadays
3 believe that the apnea hypothesis is the prevalent
4 one.

5 Q. All right. Now, in fact, we
6 have a great many different hypotheses relating to
7 Sudden Infant Death Syndrome; would you agree with
8 that?

9 A. Oh, there are many.

10 Q. But there are two principal
11 ones, one I understand being the apnea hypothesis
12 and the other one being the cardiac hypothesis,
13 that something in the system causes a malfunction
14 of the cardiac system, am I correct?

15 A. Yes, I think this is much
16 less --

17 Q. Much less accepted.

18 A. --accepted.

19 Q. And as you just pointed out,
20 it would appear that those two hypotheses are more
21 or less competing for one another?

22 A. Yes.

23 Q. You also stated before -- let
24 me see if I understand you correctly -- that the
25 presence of bradycardia is not something that
would particularly bother you in the case of Sudden



1
2 Infant Death Syndrome, but that you find the
3 presence of tachycardia most disturbing and most
4 at odds with the diagnosis; am I correct?

5 A. That is correct.

6 Q. Now, in fact, Doctor, as you
7 are aware, Dr. Becker, who is a world renowned
8 authority on the question of Sudden Infant Death
9 Syndrome, has given evidence before this Commission.
10 Mr. Commissioner, I am referring now to Volume 38,
and specifically Pages 7668 to 7669.

11 Now, Doctor, I put to you specifically,
12 against the background of my last three questions,
13 that in giving his evidence, Dr. Becker, and I am
14 summarizing now but I am sure that counsel for the
15 hospital will correct me the second that I get out
16 of line, in giving evidence indicated that bradycardia
17 is something which is also seen as a result of
18 apnea, tachycardia less so, and that in effect
19 this causes the conundrum that we were just talking
20 about, and that it is his hypothesis, and he
21 says this at page 7669, that the abnormal neural
22 control in the brain which controls both cardiac
23 output and respiration, can account for the presence
24 of all three, that is, the apnea, the bradycardia
25 and the tachycardia and that, therefore, this abnormal



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2 neural control can account for both kinds of
3 arrhythmias.

4 He then goes on to say that he
5 found scarring in the very region of the brain
6 in which this neural control is located, and that
7 one of his great areas of interest in this particular
8 case was to do a conduction study, because if he
9 could do a conduction study and show that the
10 conduction system was normal, this would strengthen
the argument for his hypothesis.

11 Now, the question I have for you is
12 this, Doctor: are you aware, from your reading of
13 the literature and your study of the literature, of
14 any studies or articles which support that hypothesis,
which help to prove it?

15 A. Yes, I think the hypothesis
16 is well founded. It is based on, I think, known
17 physiological facts. The difficulty is in
18 connecting things, for instance, in proving that
19 the lesion of the brain really produced tachycardia.

20 If you look at the cases in the
21 literature of children who had SIDS, I do not think
22 you will find many, if any, who had tachycardia.
23 Therefore, this would be an isolated instance, and
24 Dr. Becker still would have difficulty connecting the
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pathological lesion in the brain with the
tachycardia. The tachycardia may have been
caused by something else.

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Of course, had we found lesions
in the conduction system, it would have eliminated
his hypothesis, so to speak.

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Q. All right. Now, you have said that it is a well thought out hypothesis, but this is my point, Doctor, we really can't place it at this point in time as any higher than a hypothesis?

A. In my opinion that is correct.

Q. All right. And the other fact is that as you are probably aware unfortunately with respect to Baby Hines the conduction studies were never done. Now, am I correct that because the conduction studies were never done you cannot prove or disprove Dr. Becker's hypothesis, can you?

A. That's true.

Q. By the same token though, to be fair, because the conduction studies were never done you cannot prove or disprove your theory of sick sinus syndrome?

A. Correct.

Q. All right. Now, you also gave evidence the other day to the effect that you had noted in this child's chart the bradycardia preceding the apnea - this was in Miss Forster's cross-examination - and I believe that you said, is that where the bradycardia preceded the apnea causing the cardiac monitor to go off first. This was quite the opposite of what you would expect in a SIDS death?



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A. Yes.

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A. Could be.

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Q. Now, by that are you telling us that in your view in the particular instance of the terminal events in Hines that the apnea in fact was secondary to the bradycardia?

Q. All right. Can you tell us why you find that inconsistent with a diagnosis of Sudden Infant Death Syndrome; in other words, in Sudden Infant Death Syndrome what would you expect the sequence of events to be?

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A. Well, if you follow the hypothesis of apnea being the reason for Sudden Infant Death Syndrome then you have the situation where apnea will occur and bradycardia will follow, and that is very common. However, here we have a situation which appears to be just the opposite where you have bradycardia first followed by apnea. Now, this is not I don't think totally conclusive. I think one has to be fair. But it is not the usual mechanism that one would expect for the mechanism of death. There is another situation which concerns me about labelling this Sudden Infant Death Syndrome is that I was looking in the literature trying to find cases of infants who died of Sudden Infant Deaths and who



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were being monitored and I found some cases of
infants who were being monitored at home and died.

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But this happened because either the parents - I
remember one series of four where in three of the
deaths the parents had not heard the alarm go off
and therefore they arrived too late at the scene, and
the fourth baby, yes, that fourth baby the alarm
had gone off, the parents tried to revive the baby
and couldn't do it.

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But here we are dealing with a baby,
Baby Hines, in the Hospital that is being monitored
for both a heart rate as well as a pulmonary function,
a pulmonary mechanical event.

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Q. You are referring to the apnea
monitor as well as the cardiac monitor?

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A. Right. And the monitor, first
the heart rate monitor went off then the apnea
monitor and the baby could not be resuscitated.

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Now, I don't know, I'm sure there
will be instances of Sudden Infant Death Syndrome
where this will occur but probably not too many. This
is why these programs have been instituted where you
have home monitors, where you use monitors at home
to determine when these babies stop breathing and
resuscitate them before they die.



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I would like to know if at all possible, for instance, at The Hospital for Sick Children, where a lot of the very good work on the Sudden Infant Death Syndrome has been done, how many of these babies, of other babies who died at this Hospital of Sudden Infant Death Syndrome were being monitored when they died? I understand there were so many deaths, 24 deaths over a 10-year period I believe of Sudden Infant Death Syndrome, but how many of these babies were actually being monitored at the time of death? I think that would be an important question to know.

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Q. So, you are telling us then, Doctor, correct me if I am wrong in summarizing your evidence, that it is not only the presence of the arrhythmia, the tachycardia, but the fact that the bradycardia seemed to precede the apnea, the fact that the child was being monitored and also the fact that the child couldn't be resuscitated, it is a combination of all of those factors that caused you what I take it is a great concern with the diagnosis of SIDS. Is that fair?

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A. Right.

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Q. All right. Now, you have given evidence that in your view one highly possible



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explanation for this child's illness was that of
sick sinus syndrome?

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A. Right.

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Q. And I am asking you now to
assume that you were right and that indeed this baby
had sick sinus syndrom or some other conduction problem,
would that have any effect on the baby's ability to
tolerate a drug like digoxin?

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A. Yes, it might very well have.

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Q. Can you tell me what that
effect might be?

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A. The baby would probably become
more sensitive to digoxin and develop more brady
arrhythmias, slowing or slow arrhythmias.

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Q. All right. Now, upon your
review of the chart of Jordan Hines, you must have
noticed, Doctor, at no time prior to the terminal
events did the child's apnea monitor go off or sound,
at least at no time in the Hospital. What I would
like to ask you is whether or not that it is at all
significant in this case and, if so, what the
significance is?

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A. Well, I think in all fairness
I think apnea episodes were described in the baby
and the fact I would have expected the monitors to go



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off, perhaps the monitors were not set appropriately or some other technical problem that would have explained this fact but it surprised me a little bit because there were descriptions of episodes of apnea. I don't remember the exact times. I know some were before the baby came to the Hospital by the mother.

Q. Yes.

A. And then others I believe in the Hospital themselves.

Q. Would you agree that there are various types of apneas in terms of their severity?

A. Various types? Various degrees of severity?

Q. Exactly. Rather than say type I should have said time. You can have an apnea that lasts for 5 seconds, you can have an apnea that lasts for 20 seconds?

A. Yes.

Q. All right. And would you agree that ---

A. Or that there are in general various degrees?

Q. Yes.

A. Certainly, certainly.



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Q. Would you also agree that it is not uncommon to see brief periods of apnea in neonates?

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A. Right.

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Q. Now, it is my understanding as well, Doctor, that neonates generally breathe through their nose?

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A. Yes.

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Q. Assume for the moment that we had a child that was severely congestive, a child that in fact on several occasions, or at least on two known occasions, had to be suctioned due to mucus in the nasal passages. Would you expect to find a baby in that condition showing periods of brief apnea?

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A. I think it is very possible.

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Q. All right. In fact, could the nasal congestion account for those periods of apnea?

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A. Yes. One of the theories in fact for Sudden Infant Death Syndrome associated with apnea is that the apnea originates from the airway, from the upper airway, especially the pharynx, and very often this would be associated with a mild respiratory infection and precipitated by it.

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Q. Well, Doctor, with respect to levels, digoxin levels, you have given evidence, and



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I am particularly interested in the evidence which you gave with respect to Stephanie Lombardo and Jesse Belanger, if I understood your response to Mr. Lamek correctly, I believe the other day you gave evidence that the levels found in Lombardo, even though they were in exhumed tissue, were, in your view, inconsistent with one accidental administration of a maintenance dose of digoxin. Do I have that correct?

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A. Yes.

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Q. I also understood you to say to Mr. Lamek that with respect to Belanger, again subject to the caveat that the levels were obtained in exhumed tissue, you found the levels inconsistent in the Belanger case with one accidental administration of either a maintenance or loading dose. Do I have that correct?

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A. Excuse me just a second. Yes.

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Q. With respect to Jordan Hines, Mr. Commissioner, you will find this in Exhibit 95A, which is the January 11th, 1982 report of Mr. Cimbura, on page 6 he deals with certain samples taken from Jordan Hines. T6 is a heart sample, T44 liver and T45 thigh muscle. I can tell you, Doctor, that the results of the assays performed on heart tissue that



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had been fixed in Klotz solution for three months where a finding of 118 nanograms per gram of digoxin and digoxinlike substances in the left ventricle which, after HPLC, Mr. Cimbura found to be 52 nanograms, 45 nanograms per gram in the right atrium and 147 nanograms per gram of digoxin and digoxinlike substances in the septum, with a digoxin concentration of 89 after HPLC.

It was Mr. Cimbura's evidence, and he draws the conclusion right in that report, that in his opinion there would have been not less than 52 nanograms per gram in the heart tissue before fixation.

Given those levels in Hines, are they consistent or inconsistent in your view with one accidental administration of a maintenance dose of the drug?

A. Could you repeat the first myocardial level?

Q. Yes, in the left ventricle?

A. Yes.

Q. 118 nanograms per gram.

A. Yes. This was in fixed tissue, is that right?

Q. That is correct, which had been



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in preservative for three months.

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A. Yes. Yes, that is high. The question now, I'm sorry?

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Q. Would you find those levels ---

MS. CRONK: I'm sorry, sir, to interrupt. But just so the doctor is clear, that, as Mr. Tobias originally said, was the reading for both digoxin and digoxinlike substances.

MR. TOBIAS: That is correct.

MS. CRONK: That is not the digoxin concentration level in the left ventricle, that was 52.

THE WITNESS: Yes, but that is the reading we usually used, we used the total RIA.

MS. CRONK: You can use whatever you wish, Doctor, but just so that you are clear that the concentration was 52.

THE WITNESS: Yes, okay.

MR. TOBIAS: Yes, that is correct. The readings in fact were lower on all samples that were subsequently done by RIA and HPLC?

THE WITNESS: Yes, that is always the case.

MR. TOBIAS: Q. The question is though, given those levels generally, do you find that



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consistent or inconsistent with one accidental
administration of a maintenance dose of the drug to
this child?

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A. I find it inconsistent.

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Q. Now, what is your opinion if
I posit this example to you? Are those levels
consistent or inconsistent with one accidental
administration of a loading dose to the child?

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A. That would be very difficult
to answer. I don't think I could answer this question.
I think it could be consistent with it but I find
it difficult from a practical standpoint to see how
that could happen.

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Q. All right. Now, we have heard
certain evidence before this Commission, principally
from Dr. Spielberg, regarding the possibility of
drug error. Are you familiar with the drug called
ampicillin?

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A. Yes.

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Q. It is my understanding, correct
me if I'm wrong, that that generally during the time
period with which we are dealing with, was available
in The Hospital for Sick Children in powder form and
had to be diluted. Given that scenario, do you think
or can you give me an opinion as to the likelihood



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of digoxin having been given mistakenly to a child
by one under the impression that it was ampicillin?

A. I think it would be unlikely.

Q. Are you familiar with the
drug called gentamicin?

A. Yes.

MR. TOBIAS: Mr. Commissioner, may I
see Exhibit 224 and 225.

Q. Doctor, Exhibit 225 is a
container containing various drug vials. We see in
a clear bottle lanoxin, which I take it is the brand
name for digoxin?

A. Yes.

Q. We also see a vial of what is
gentamicin. Judging from the type of caps on the
vials, the size and shapes of the vials, do you have
any opinion as to the likelihood that one could
mistakenly give a child digoxin having intended to
administer a dose of gentamicin?

A. Yes. Again, I find it unlikely;
not impossible but unlikely.

Q. All right. Can you help me
at all with respect to the various volumes and
concentrations which would be given with respect to
gentamicin on the one hand and digoxin on the other?
Are they the same or are they different?



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A. I am not sure I can help you there. My understanding would be that the administration of gentamicine, and ampicillin, of course varies from hospital to hospital the way it is administered.

Q. I understand.

A. But very often, for instance, it is placed into the buretrol and it is permitted to flow into the body either rapidly or more slowly, so there are different ways of administering it.

Digoxin is not given that way though, it is a different way and I would have to know how the drug was administered in order to answer your question.

Q. Now, we know that on March the 6th Jordan Hines was in a room by himself, he was in isolation, we also know that on March the 7th, which was a Saturday, he was moved to a ward where there were other children.

Assuming, Doctor, that Jordan Hines had received a dose of digoxin intended for another child, and the example I will use is a maintenance dose, would you still have difficulty in explaining the levels found in the myocardium tissue in Jordan Hines?

A. Yes, I believe I mentioned



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that.

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Q. And would it be possible to

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give a loading dose orally?

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A. Yes, it is, but you know it is

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an unlikely error I think. I think a maintenance

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dose would be easier to make an error with, but a

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loading dose in my opinion would be very unlikely.

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Q. And why is that, Doctor, can

you explain that?

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A. Because it is one dose only

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usually, or you divide it up into several aliquotes

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you may give half, and then a quarter and one-quarter,

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but they are larger doses, they are especially - let's

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say prescribed separately from the maintenance

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dose and I think the nurses pay a lot of attention,

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everybody, the doctors also, to this dose, they

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calculate it very carefully because everybody knows

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very well that mistakes could be fatal if you make

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a mistake in your initial dose, it could be a very

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serious problem. So I think one is very cautious

about administering a loading dose of digoxin.

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Q. Doctor, I will show you Exhibit

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103, the medical record of Jordan Hines, and at page

23

69 in that record, Mr. Commissioner, ---

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THE COMMISSIONER: I think he has it.

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THE WITNESS: I believe I have it.

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MR. TOBIAS: Thank you.

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Q. At page 69 through to 71 we see the arrest note of Dr. Costigan wherein he reports in a great amount of detail the resuscitation efforts made with respect to this child, which I believe lasted some two and a half hours. It appears on my reading of the note that one would have expected some marked impairment after arrest with respect to this baby's circulatory system, is that a comment and an observation with which you would agree?

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A. Yes. I think that is probably the case in every arrest, but especially in a prolonged one.

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Q. Looking about half way down the page, where I see, I see references such as "complex is now very small"; I see other references to "no response", about eight lines up from the bottom. Obviously this resuscitation effort unfortunately and tragically was not successful.

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I might ask you this; if indeed circulation was markedly restricted during that time; I am going to ask you to assume that the child was given a dose by error during resuscitation.



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3 Now, we know how long the resuscitation
4 went on, it would have had to have been during a
5 two or two and a half hour period when the mistake
6 occurred, under circumstances where circulation was
7 impaired; is it likely in your view if that were
8 the scenario indeed that occurred, that we would
9 expect to find levels in myocardium tissue of the
10 kind that we did in Hines?

11 A. No, I think it would be very
12 unlikely, because there must have been time for
13 distribution of the drug to reach a level of this
14 magnitude, that is my impression.

15 Q. Your view is that there was
16 not enough time given the impairment to the circula-
17 tory system?

18 A. Right. Because with very
19 severe impairment of the circulation the distribution
20 is clearly affected and it is much slower than it
21 ordinarily would have been.

22 Q. Now, I notice, Doctor, that
23 with respect to Justin Cook and particularly with
24 respect to your report, you rated the probability of
25 massive digoxin overdose initially as "fair". With
respect to Hines you rated that probability as
"good"; and I understood your evidence to be that



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2 in both of those assessments you were relying just on
3 the clinical picture.

4 A. That is correct.

5 Q. Can I draw from that the
6 inference then that on the clinical picture alone,
7 excluding the toxicologic data, on the clinical
8 picture alone that you felt that Hines was a better
9 candidate for digoxin overdose than Cook was?

10 A. Yes.

11 Q. Mr. Lamek asked you the other
12 day, and I am referring, Mr. Commissioner to Volume
13 75, page 6564; he asked you what it was that you
14 would be looking for clinically which might be
15 suggestive of digoxin intoxication. I believe your
16 answer was, I believe I do it justice by summarizing
17 it this way. You said you were looking for whether
18 or not the child's death could be explained on the
19 basis of his original heart problems, and also the
20 suddenness of the deterioration and was this
21 explainable by the child's original problems.

22 Obviously because you rated Hines
23 as a good probability of massive digoxin overdose,
24 there was something in his chart that caught your
25 eye. Am I correct in assuming from that rating that
you would not have expected, in the ordinary course,



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2 this child to have died from his original problems.

3 A. That is correct.

4 Q. And that is more so given the
5 fact that he was in the Hospital and being monitored?

6 A. Right.

7 Q. I take it obviously if one has
8 conduction problems the safest place to be is in
9 hospital being monitored.

10 A. That is true.

11 Q. All right.

12 A. Another hypothesis that has
13 been brought forth with regard to this baby is one of
14 sepsis.

15 Q. Yes.

16 A. And that of course is another
17 consideration which I think may be important, and
18 maybe this is what influenced Dr. Nadas in his
19 categorization of this baby in the worst category,
20 than I did. Sepsis sometimes can be very tricky
21 and difficult to diagnose, although to my knowledge
22 in this particular situation there was no laboratory
23 proof of that.

24 Q. Doctor, this is my last
25 question of you. I would like you to listen to it
carefully. At the preliminary hearing you expressed



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2 an opinion that in the case of Baby Hines there was
3 a high probability that this child's death was
4 related to a digoxin overdose; and you again stated
5 that the other day to Mr. Lamek in examination in
6 chief. You have now undergone two or three days
7 of cross-examination, you have reviewed and re-reviewed
8 this chart, and you have obviously thought about this
9 case a great deal. Is it still your opinion today
10 that this baby's death is a death which is very
probably related to digoxin overdose?

11 A. Yes, I think the probability
12 is high.

13 MR. TOBIAS: Thank you, Doctor,
14 those are all my questions.

15 THE COMMISSIONER: Thank you.
16 Mr. Hunt?

17 MR. YOUNG: Before my friend
18 begins his questions you will recall that you
19 afforded me an opportunity to re-examine this witness
20 and I have no questions for him, so that is not a
problem.

21 THE COMMISSIONER: Yes, all right.

22 MR. YOUNG: However, there is
23 one question that I would ask Miss Thomson through
24 you. During Mr. Tobias' cross-examination it
25



came to light that the Doctor would find it useful to have some information with respect to children who died as a result of SIDS at the Hospital for Sick Children.

THE COMMISSIONER: Whether or not they were monitored?

MR. YOUNG: Whether or not they were monitored, yes.

THE COMMISSIONER: Yes, all right.

MR. YOUNG: I wonder if counsel for the Hospital would be good enough to supply us with that information?

MR. TOBIAS: I am standing, Mr. Commissioner, because I support my friend's request.

MS. THOMSON: Mr. Commissioner, at this time I have no understanding of what would be involved in producing that material.

THE COMMISSIONER: You will take the matter under advisement?

MS. THOMSON: We will undertake to do that, Mr. Commissioner.

THE COMMISSIONER: Yes, all right. Thank you, Mr. Hunt.



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3 MR. HUNT: Yes, sir, I won't be
4 very long.

5 RE-EXAMINATION BY MR. HUNT:

6 Q. Firstly I would like to ask you
7 about Justin Cook and the beginning of his downturn
8 at 3:45 a.m. in the morning. You were asked a number
9 of questions about this by my friend, Mr. Brown
10 concerning the nature of this event that began 3:45
11 and culminated in Justin Cook's death at 4:56.

12 You indicated that on the examination
13 of the clinical events, beginning with the entire
14 course, the entire clinical course and having regard
15 to the cyanotic spell that he had at 6 o'clock, as
16 to whether or not the events at 3:45 could be
17 accounted for as another cyanotic spell. I think
18 you indicated that the clinical events themselves
19 were ambiguous with respect to that?

20 A. Right.

21 Q. Now, my question is, if you
22 have regard to the toxicological evidence that there
23 is, that is the level of digoxin in the blood sample
24 taken at 4:30, and the level of the digoxin in the
25 tissue sample that is obtained after 4:56, it is
more probable that the events beginning at 3:45 are
the effects of the administration of the dose of



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2 digoxin, than it is that those events are another
3 cyanotic spell?

4 A. Yes.

5 Q. Now, you were asked a number
6 of questions by my friend Mr. Scott yesterday
7 concerning Dr. Rowe's diagnosis with respect to
8 a number of the children, and whether or not you
9 were in agreement, or disagreement with that.

10 Now, with respect to Baby Woodcock,
11 you were asked - first of all my friend Mr. Scott
12 read to you from the evidence of Dr. Rowe, and for
13 my friend's assistance I am referring to Volume 79,
14 pages 7237 and following, and I am not going to go
15 over all of the evidence that Mr. Scott read to you
16 from Dr. Rowe, where Dr. Rowe sets out his diagnosis.

17 Then you were asked whether if this had
18 occurred, this death had occurred in your hospital
19 in Chicago, whether at the meeting on the following
20 morning, that is the morning following the death,
21 what type hypothesis you would suggest is worthy
22 of consideration by your staff for Baby Woodcock's
23 death, and I am referring to page 7248 and following.
24 You indicated that while - at 7249 and 7250, that
25 you really would be at a loss to explain the child's
death based on those findings, but that if you



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excluded digitalis intoxication then the best
hypothesis that could be discussed at that hypothe-
tical meeting on the day following would be one of
a combination of factors, being liver disease,
pulmonary disease and possible, possibly some
heart disease.

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Mr. Scott pointed out to you at 7251
that that is in effect the same hypothesis, or the
same as Dr. Rowe's evidence, and you agreed. Now
you indicated as well that there is a difference
between a hypothesis, or that there are degrees of
differences between hypothesis.



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At some point it becomes a diagnosis, and I think you indicated at Page 7261 that if it is really well substantiated by the facts, then it becomes a notional diagnosis; do I have that correct?

A. It becomes a diagnosis.

Q. Yes, the word "notional" is in the transcript at page 7261 and I did not remember you saying that, but you can indicate ---

A. Actual. I am not sure.

Q. In any event, if your hypothesis is really well substantiated by the facts, then it may be a diagnosis?

A. Right.

Q. All right. Going back to the little hypothetical that Mr. Scott posed here, you have indicated what would be the hypothesis that you would feel is worthy of some consideration at the meeting the following morning if this death had occurred in your hospital.

My question to you is, in the course of your examination of the chart and the medical records of Laura Woodcock, did you see the type of facts there that would substantiate that hypothesis to the extent that would allow you to



1
2 elevate it into a diagnosis?

3 A. No.

4 Q. So if we carry on the little
5 hypothetical that Mr. Scott put to you if this had
6 occurred at the hospital in Chicago, if the State of
7 Illinois was to call an inquiry or a Commission into
8 that death, I take it that you would not be prepared
9 to advance that hypothesis as a diagnosis?

10 A. No.

11 Q. Finally, I just wanted to ask
12 you about the meeting of September 13th that we
13 have heard so much about where there was canvassing
14 of opinions on the various babies and their causes
15 of death, and my friend, Mr. Scott, asked you to
16 review the procedure that was followed, and that is
17 set out at page 7284 and a few pages following.
18 You indicated that it was your feeling, and this
19 is at page 7286, that the final decision was that
20 of Dr. Bennett, and so it was really his vote that
21 counted.

22 Can I ask you, I take it that that
23 was your feeling as a result of the fact
24 that Dr. Bennett was the chief coroner for the
25 province, and he was the one who you felt would have
to make this decision as to what the parents would



be told?

A. That is correct.

Q. I take it, though, it would not surprise you to know that your opinion may have been viewed by others there to be really a critical opinion in terms of the assessment they had to make?

A. No.

MR. HUNT: Thank you. Those are all the questions I have.

THE COMMISSIONER: I am not sure I know what that last -- you said it would not surprise you to hear that?

THE WITNESS: Right.

THE COMMISSIONER: I see.

Ms. Cronk?

MS. CRONK: Yes, thank you, sir.

RE-DIRECT EXAMINATION BY MS. CRONK:

Q. Dr. Hastreiter, I assure you I will be brief.

Just following up on the last question of my friend, Mr. Hunt, and also questions put to you earlier by Ms. Jackman, I had understood you to tell Ms. Jackman this afternoon that you had received a copy of the minutes both from the meeting of August 27th, 1982 and the subsequent meeting held



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on September 13; did I understand that correctly?

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A. Yes.

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Q. All right. Can you help me, Doctor, prior to coming to Toronto to prepare for your evidence here before this Commission, had you received a copy of those minutes?

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A. I do not remember exactly. I believe I had, yes.

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Q. Just so that I am clear on it, Doctor, because I thought there was certainly a matter of some confusion in my mind, after the meetings themselves had been held in the late summer and early fall of 1982, were you provided shortly thereafter or within a matter of weeks of those meetings with a copy of the minutes, as best as you can recall it?

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A. Yes, I believe so, yes.

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Q. Then I had misunderstood it. Thank you, Doctor. Doctor, could I ask you as well now to address your mind to the case of Allana Miller. You will perhaps recall that in the last day or two, your attention was drawn during cross-examination by Miss Forster to Exhibit 276, and perhaps the Registrar could put that in front of you. That, Dr. Hastreiter, you will recall is the article provided by you



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concerning the case of an infant who accidentally
received 2 milligrams of digoxin in substitution
for an intended 2 milligrams of Lasix. Do you recall
the article?

A. Yes.

Q. The first question I have with
respect to that article --

A. I have the article.

Q. Do you have a copy there?

A. Yes, I have a copy.

THE COMMISSIONER: We have it.

MS. CRONK: Exhibit 276, Mr. Registrar.
Sorry, do you have it?

THE REGISTRAR: Yes, we have it.

MS. CRONK: Q. I am sorry. Doctor,
my first question is simply this: in the synopsis
of the case report which appears at page 1 and over
onto the beginning of page 2 of the article, it is
indicated that following the inadvertent administration
of 2 milligrams of digoxin, the child ---

THE COMMISSIONER: Which case is this?
This is 276, is it?

MS. CRONK: Yes, sir, Exhibit 276,
the bottom of the page under "Case Report". This is
the case report, Mr. Commissioner, of the child who



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received 2 milligrams of digoxin in lieu of Lasix.

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Do I have the wrong exhibit number? It is entitled

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"Accidental Digoxin Overdose in an Infant Post Mortem

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Tissue Concentration" by Dr. Hastreiter.

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THE COMMISSIONER: Oh yes, all right,
sorry.

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MS. CRONK: Sorry, sir.

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THE COMMISSIONER: I am falling apart.
Yes, all right, go on.

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MS. CRONK: I know the feeling, sir.

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It is late in the day.

12

Q The bottom of the very first
page. Dr. Hastreiter, you will recall that it is
indicated that following the inadvertent administration
of digoxin, the patient developed ventricular
fibrillation and the following language appears:

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"Ventricular fibrillation ensued

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and the infant expired about 45

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minutes later."

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I confess to you, Doctor, some confusion in my mind
about the meaning of that language. Can you help us?

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Do you know for a fact whether death followed within

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45 minutes of administration of the dose of digoxin

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or whether death followed within 45 minutes of the

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development of ventricular fibrillation, there possibly

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being a time difference, as you will appreciate. Do
you know what the facts were?

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THE COMMISSIONER: Grammatically --
do you know anything more than ---

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THE WITNESS: No, my impression was
that the baby had died 45 minutes following the
administration of the drug. However, there is still --
the information I got was a little bit scarce, and I
would not completely rule out the possibility that
the cardiac arrest occurred at 45 minutes and that
the baby ---

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MS. CRONK: Q With some then
succeeding interval between the cardiac arrest and
the development of ventricular fibrillation?

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A. And death, yes.

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Q Thank you, Doctor. Doctor,
with respect to the same case incident report, you
told Miss Forster, as I understood it, that it would
take, in your judgment, approximately 4 vials of
adult digoxin preparation to correspond to 2 milli-
grams of digoxin; do I have that correctly?

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A. Yes.

Q And directing your mind to the
amount of Lasix which had been intended to be admini-
stered, that is 2 milligrams of intravenous furosemide,



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you told her, if I understood it, that that was the equivalent of approximately one-fifth of an ampule of Lasix; do I have that correctly as well, Doctor?

A. Yes.

Q. You will perhaps recall, Doctor, in the case of Allana Miller, that it was intended, according to the progress notes and the medical record of that child, that she received 6 milligrams of Lasix at approximately 2:40 a.m. on the morning of her death; do you recall that?

A. Yes.

Q. Do you recall as well, Doctor, that according to the progress notes the drug that in fact was administered at that time was administered by intravenous push by Dr. Soulioti, it was a doctor, a physician; do you recall that?

A. Yes.

Q. Assuming, Doctor, that 6 milligrams of digoxin were confused at 2:40 in the morning in the case of Allana Miller for 6 milligrams of Lasix, am I correct that that would be the equivalent of 12 vials of the adult digoxin preparation based on your calculation?

A. How many milligrams of digoxin?

Q. 6 milligrams of digoxin in



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substitution for 6 milligrams of Lasix. I am correct, am I not, that based on the calculations that you have given us, that is the equivalent of 12 adult vials of digoxin?

A. 6 milligrams of digoxin would be equivalent to 12 vials of digoxin, yes.

Q. Yes, thank you. If that substitution occurred, if 6 -- I am sorry, I will put it another way. If 6 milligrams of Lasix, which was intended to be given, had in fact been given, on your calculations that would be the equivalent, I suggest, of approximately 3/5ths of an ampule of Lasix?

A. That is correct.

Q. All right. It follows, does it not, Doctor, that if 6 milligrams of digoxin were confused in this instance for 6 milligrams of Lasix, that would necessarily involve mistaking 12 vials of adult digoxin for less than 1 vial of Lasix; is that correct?

A. That is correct.

Q. In this situation that mistake would have to have been made by Dr. Soulioti, the physician who is recorded to have administered the drug at 2:40 in the morning?

A. Yes.



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Q Can we agree, Doctor, that a mistake of that kind in those circumstances is unlikely?

A. Very unlikely.

Q Am I correct as well, Doctor, that if the 6 milligrams of Lasix that had been intended to be given had been given that that could physically have been administered in a 1 cc syringe?

A. Yes.

Q That being the case because it was approximately 1/5th of an ampule of Lasix?

A. Right.

Q And if, Doctor, a syringe was handed to a physician who called for -- let me attempt that one again in a different way.

If a physician called for 6 milligrams of Lasix and was handed a syringe containing 6 milligrams of digoxin, I suggest to you that that would be a syringe on a rather larger order than a 1 cc syringe?

A. Right.

Q And Doctor, if that in fact had been the case, that is, if a doctor who called for the drug in those circumstances or handed a rather larger syringe containing 6 milligrams of digoxin, would you, in those circumstances, expect that to be a difference which the attending physician might note?



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A. Yes, I think it would be very difficult to make this type of error.

Q. It is a rather large syringe, is it not, Doctor?

A. It would have to probably be a 10 cc syringe versus a 1 cc syringe, which would have been used for the Lasix.

Q. I am sorry, a 1 cc for the Lasix and a 10 cc for the digoxin?

A. And a 10 cc for the digoxin, yes.

Q. Thank you, Doctor. Doctor, I would ask you to assume for a moment, despite the opinion you have just expressed as to the likelihood of that kind of an error, I would ask you to assume for a moment that 6 milligrams of digoxin was in fact administered to the child at that time, at 2:40 in the morning, instead of the intended Lasix; would you make that assumption for me for the moment?

A. Yes.

Q. You told Miss Forster, and I think you have just told me again, that if that had been the case, a very large dose of digoxin in fact would have been administered; do I have that correctly?

A. Oh, very large. It would be the highest dose ever administered to a baby, I think.



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Q. All right. Well, Doctor, my question quite simply is this: if that amount of the drug had been given intravenously at that time to the child, would you not have expected Allana Miller's digoxin level in her serum to be higher than 78 nanograms which we know it to have been?

A. Well, that, of course, has to do with the time interval also.

Q. Well, to help you with that, Doctor, and you are welcome to look at the medical record, the drug, whatever it was, is recorded to have been given at approximately 2:40 in the morning, within 5 minutes the child develops adverse symptoms and the child is pronounced dead as distinct from perhaps the actual time of death, I believe, by, am I correct, is it 3:27 in the morning?

A. Yes, 3:27.

Q. And my question to you quite simply is this, Doctor: given that time interval and recognizing the largeness of the dose that we are postulating, would you not expect to see a higher concentration of digoxin in the blood serum of that child if that amount of digoxin had in fact been given?

A. Yes, because the time interval



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being so short, there really would not have been time for significant distribution and, of course, some of it would depend on the status of the circulation after the arrest from 2:30 to 3:27, but one would not expect it to be very good. Therefore, the distribution would have been minimal or small, and the level would have been very high.



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Q. And indeed, Doctor, to relate to what you have just said regarding distribution time to the other facts in this case, we know that in Allana Miller's case the concentrations of digoxin found in tissue specimens from her body were virtually negligible, very low indeed, were they not?

A. Yes.

Q. All right. And in those circumstances can you, with a fair degree of confidence, suggest to us there was very little time for distribution of digoxin from the blood to the tissues?

A. Well, I think with the reservations of trying to quantitate fixed tissue, right?

Q. Yes, it was fixed, yes.

A. We have to be very careful with that, but yes, in general I would agree with your statement.

Q. Thank you, Doctor. Mr. Registrar, could you show the doctor Exhibit 286, if you would, please, unless you have a copy, Doctor. That is a copy of the case report which was marked yesterday morning, as I understand it, and you provided



1
2 it to Mr.Lamek. I would like to relate that to the
3 Allana Miller situation. It is Exhibit 286, Mr.
4 Commissioner.

5 As I understand it, Doctor, this is
6 a case report. Do I have it correctly that you
7 prepared it?

8 A. Yes.

9 Q. All right. This concerns a
10 six week old child who had received in error
11 .6 milligrams of digoxin rather than an intended
12 dose of a much lower amount. Do I have that correctly?

13 A. Yes.

14 Q. And the amount that the child
15 actually was recorded to have received was .6
16 milligrams?

17 A. That is correct.

18 Q. All right. And the child at
19 the time the dose was administered was approximately
20 three kilos in weight?

21 A. Yes, a little less than three
22 kilos.

23 Q. And the child died, as I
24 understand it, Doctor, within one hour following
25 administration of that dose of digoxin.

A. Yes.



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Q. All right. Doctor, am I reading the case report correctly that the post mortem blood digoxin level measured on that child was greater than 1,000 nanograms per millilitre?

A. Yes, that was the information that was provided to me by the coroner.

Q. All right. And that level was achieved in a child where death ensued within one hour of the time of administration of a dose of .6 milligrams?

A. Right.

Q. All right. My suggestion to you, Doctor, is simply this, that if Allana Miller had received 6 as opposed to .6 milligrams, 6 milligrams of digoxin instead of 6 milligrams of lasix, might we reasonably in your view given a relatively similar time interval between the time of the dose and death expect to see a very high concentration of digoxin in the blood serum, perhaps as we see in this case?

A. That is what I would have expected, yes.

Q. Doctor, two final points. Earlier this morning you will recall that Mr. Shanahan who represents the parents of Stephanie



1
2 Lombardo drew your attention to that child's
3 medical record. I would ask you if you would
4 to look at it very briefly for a moment. It is
5 Exhibit 78, Stephanie Lombardo.

6 Doctor, would you turn, if you would,
7 to page 41.

8 A. Okay.

9 Q. As I understood your evidence
10 this morning, it was suggested to you, and you were
11 asked for your opinion as to whether or not it was
12 possible that an oral dose of digoxin might have
13 been administered to this child at the time of the
14 second feeding that was given to the child prior
15 to her death. Do you recall that discussion with
16 Mr. Shanahan?

17 A. Yes.

18 Q. If I understood your evidence
19 correctly, you suggested that it was possible that
20 that could have happened.

21 A. Yes.

22 Q. All right. If we look at the
23 nursing note which appears at the bottom of page
24 41 of the medical record, Doctor, and I know that
25 you have been requested to look at this a number of
times, so I will be brief, but I suggest to you that



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2 there was an earlier feeding at a time unknown but
3 at least at some time after 1900 hours on the
4 evening of December 22nd and that the child
5 after, it was described as having fed eagerly
6 and having a regular heart rate after that feeding.

7 A. Yes.

8 Q. Is that correct, Doctor?

9 A. Yes.

10 Q. And we don't know the time of
11 that feeding, am I correct?

12 A. Yes.

13 Q. And there was then a second
14 feeding, Doctor, and it would appear, perhaps
15 necessarily so, that the time of the second
16 feeding was prior to 3:30 in the morning on March
17 23rd because we know that was the time when the
18 cardiac arrest was called so, presumably, the
19 second feeding took place some time in advance
20 of that.

21 A. Yes.

22 Q. And the description which appears
23 with respect to the child's condition following that
24 feeding, Doctor, and Mr. Shanahan drew this to your
25 attention, was that the child became restless after
the second feeding, however, settled well. Do you



1
2 see that description, Doctor?

3 A. Yes.

4 Q. Doctor, if that description
5 of the child's condition be accurate, and assuming
6 that the child received an oral dose of digoxin at
7 the time of that second feeding, is that a response
8 which you in your experience would expect to see in
9 a child who received a dose at that time?

10 A. I think it would be a little
11 bit somewhat unusual for the child to settle down
12 and so forth, but it is possible. I think it is
13 possible because the effects will not be manifested
14 until some time later and the time period could
15 be anywhere from the initial symptoms, that could
16 occur anywhere from 13 minutes to about 2 hours or
17 so. So, I don't think it is impossible.

18 Q. All right. Not impossible, but
19 unusual?

20 A. Unusual.

21 Q. Thank you, Doctor. Doctor, there
22 is another matter that troubles me slightly about
23 this. You have said in evidence, as I understand
24 it, that in your view if an oral dose of digoxin
25 was administered to this child, you felt it most
likely that that would have been done some two hours



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prior to the onset of her critical symptoms. Do I
have that correctly?

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A. Yes.

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Q. And her critical symptoms
we know appear to have started at 3:30 in the morning,
which places the time of administration at approximately
1:30 in the morning.

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A. Right.

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Q. Doctor, we have heard from a
number of other witnesses, and I tell you immediately
from the pharmacologists who have to date testified
before the commissioner, that in the instance of
an oral administration of digoxin, the time for
distribution of that drug from blood to tissues
is very significantly different from the time curve
or the time of distribution which we should be
talking about in the case of intravenous administra-
tion. Do you accept that as a general proposition?

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A. Yes.

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Q. And we have heard, Doctor, I believe
earlier from Dr. Spielberg by way of example that
the optimum time for sampling for example following
oral administration is approximately six hours after
the oral dose was given.

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A. That's true.



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Q. Which I suggest implies that full distribution is likely to have occurred by six hours?

A. Yes.

Q. All right. Now, Doctor, in those circumstances, if we assume that an oral dose of digoxin was given to Stephanie Lombardo at approximately 1:30 in the morning, that onset of the critical symptoms was at 3:30, some two hours later, the child was pronounced dead at approximately 4:20 in the morning, we have then, I suggest to you, approximately a three hour interval between the time that the drug is given and the time that the child is pronounced dead. Would you agree?

A. That's right.

Q. Do I recognize that indeed the child may in fact have died a little bit earlier than that prior to actually being pronounced dead?

A. Right.

Q. Assuming the outside time frame, Doctor, that is, three hours on that scenario, if the drug was given in those circumstances at 1:30, could that in your view account for what you have described to be relatively high and



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TORONTO, ONTARIO

Hastreiter, re.ex.
(Cronk)

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consistent digoxin concentrations in her tissue
specimens?

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A. Excuse me just a second,

let me look at that.

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Q. To help you with that, Doctor, concentrations found in Stephanie Lombardo's exhumed tissues, you may have them elsewhere, but they are set out in Mr. Cimbura's report dated March 25th, 1982.

A. Yes..

Q. 225 nanograms in chest fluid, 667 nanograms in a specimen from the septum of the heart, 487 nanograms from the left ventricle, 354 nanograms in the liver, 289 in the lung, 281 in the muscle, 629 in the stomach contents. Do you have those, Doctor?

A. Yes.

Q. My question to you, Doctor, is, given three hours at the outside between the time of administration of the dose and the time of death, is that sufficient time in your view, given an oral administration of digoxin, to account for what I suggest are relatively high and consistent digoxin levels or concentrations in these tissues?

A. I think this question is difficult to answer because we are again dealing with exhumed tissues and the reliabilities of the values, the factors which influenced this high concentration are unknown.



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So, I think chances are that distribution is rather complete if you reach high levels like this, but I really don't know. You know I don't have enough data to say.

In fact, I think I am impressed at looking at these exhumed tissues that the concentrations are generally higher than I would have expected and I am sure - I am not sure but I suspect very strongly that there is a factor that will concentrate probably this dehydration which will make the digoxin appear more concentrated than it actually was.

My problem is of course that I don't know what the actual level would have been in the fresh specimen and with this reservation I would say, yes, I would agree that the levels are high and one would expect fairly full distribution.

Q. All right. I take it then, Doctor, that in your judgment it is possible that an oral dose administered at 1:30 could result in those kinds of levels?

A. Yes.

Q. Do you consider it likely or are you able to assess that?

A. I find it very difficult to assess with the information we have at hand.



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Q. Doctor, one final question.

With respect to Kristin Inwood and your discussion this morning with Mr. Labow, as I understood it, and this is a matter of some confusion in my mind from my notes this morning, Mr. Labow has asked you whether or not the therapeutic doses of digoxin which this child had received during life could account for a level of 400 in her heart, and I thought he said in her heart and I believe your answer was yes.

Do you recall that discussion?

A. Yes.

Q. All right. I take it you were not suggesting Doctor that the therapeutic doses of digoxin which Kristin Inwood is known to have received during life could account for a digoxin concentration in her serum post mortem of 400?

A. Oh, no, never.

MS. CRONK: All right, thank you, Doctor. Doctor you have been very patient and on behalf of the Commissioner I thank you for your evidence over this last many days.

THE COMMISSIONER: Thank you indeed, Doctor.

THE WITNESS: You are welcome.

THE COMMISSIONER: I would depart as



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quickly as you can and not even answer any letters.

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We are very grateful to you, thank you indeed.

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10:00 o'clock tomorrow morning.

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MR. TOBIAS: Mr. Commissioner, I hate

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to do this at a quarter after five. Could we get

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some sort of an idea as to how long argument on the
motion will be?

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THE COMMISSIONER: No, because you

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don't know what the crazy Commissioner is going to

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say.

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MR. TOBIAS: Well, all right.

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THE COMMISSIONER: You see, you may be

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very short and brief but I may start to - I am allowed
to speak in argument you see.

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MR. TOBIAS: Yes.

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THE COMMISSIONER: My anticipation,

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for what it is worth, it will be about an hour and a

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half. That is what I think, but it may be exactly

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three minutes.

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MR. TOBIAS: Thank you.

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THE COMMISSIONER: All right.

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MS. CRONK: Excuse me, Mr. Commissioner,
just before you leave. I'm sorry, Sir. In light

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of that comment, would it be advisable then to have

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our next respective witness here at 10 tomorrow.

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I was about to recommend to her counsel that it be
about 11 o'clock, perhaps I'm not safe in doing that.

THE COMMISSIONER: I think you are
safe, certainly, if she was here by 11.

MS. CRONK: Thank you, Sir.

--- whereupon the hearing adjourned at 5:15pm
to be reconvened on Thursday, December 15,
1983 at 10:00 am.

